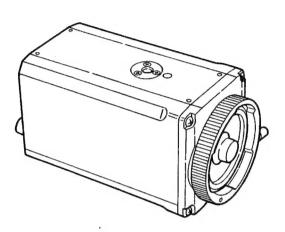
**3CCD Color Video Camera** 

# DXC-930/930P DXC-930WD

Revised-1





#### SAFETY RELATED COMPONENT WARNING

Components identified by shading and  $\bigwedge$  marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC rules.

#### For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

#### Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

#### Bescheinigung des Herstellers

Hiermit wird bescheinigt, daß die CCD-Videokamera DXC-930P in Übereinstimmung mit den Bestimmungen der Amtsbalattverfügung Nr. 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

#### Hinweis

Gemäß dem Amtsblatt des Bundesministers für das Post- und Fernmeldewesen Nr. 163/1984 wird der Betreiber darauf aufmerksam gemacht, daß die von ihm mit diesem Gerät zusammengestellte Anlage auch den technischen Bestimmungen dieses Amtsblattes genügen muß.

#### WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.





This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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# SECTION 1 GENERAL DESCRIPTION

#### 1-1. FEATURES

#### High picture quality

The DXC-930/930P\* 1/2-inch CCD color video camera can produce high quality pictures thanks to adoption of a high performance three-chip CCD pickup having about 380,000 (DXC-930\*) or 420,000 (DXC-930P) effective picture elements. Three features of the camera that combinedly ensure high picture quality are:

- High horizontal resolution: 720 TV lines;
- High sensitivity (defined as minimum required illumination): 2,000 lux at f/5.6 (DXC-930\*) or f/5 (DXC-930P);
- High signal-to-noise ratio: 58 dB (DXC-930\*) or 56 dB (DXC-930P).

#### Very small size and light weight

Being very small and very light, the camera can be installed easily and safely even in strictly limited spaces where other small-sized video cameras cannot be. This feature makes it possible to use the camera in an inconspicuous manner. The following are some examples of application:

- Installing on ceilings, walls, pillars or other building members of theaters, concert halls, and so on;
- Incorporating in video conference systems:
- Using as a microscopic or endoscopic system component;
- Using as a roof-top weather monitor camera.

#### Wide range of incident light control

Thanks to its AGC (automatic gain control) and CCD iris control capabilities, the camera can cope with even great variations in the illuminance of the subject to produce clear and sharp pictures. When shooting under low light, the AGC feature automatically increases the video gain up to eight times. When the amount of incident light is excessive, the CCD iris control feature automatically increases the shutter speed to nearly the same effect that the lens iris is narrowed three stops down. You can use AGC and CCD iris control combinedly with automatic lens iris control. Combined use of AGC and CCD iris control will also be very advantageous when using the camera with a microscopic system.

### Electronic shutter to help overcome difficult shooting conditions

A wide speed range electronic shutter function helps you to overcome awkward shooting conditions. It gives you clear pictures of limited blur even when the subject is fast moving, and acceptably bright still pictures of low-illuminated subjects. When set to flickerless mode, the electronic shutter allows you to take flickerless pictures even under fluorescent light. Furthermore, when you use the electronic shutter in Clear Scan<sup>TM</sup> mode, you can shoot computer screen displays without horizontal stripe noise.

#### **External synchronization**

Operation of the camera can be synchronized with an external reference sync signal. When a multi-camera system is built using a number of DXC-930/930P\* s, this feature permits video switching and special effect operations to be carried out without involving camera-to-camera variations in picture tone.

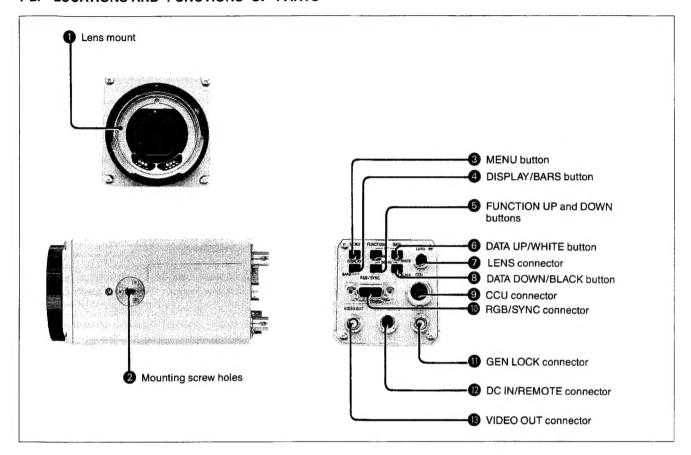
## Useful interfaces for building a powerful camera system

- Three formats of video output are available (composite, Y/C, and R/G/B) to supply a high quality picture signal to various types of video monitor, VTR, and other video equipment.
- An RM-930 remote control unit (not supplied) can be connected to the camera.
- Connecting a CCU-M3/M3P/M7/M7P camera control unit (not supplied) to the camera will permit picture signal transmission over a long cable line of up to 100 m (328 feet) (for the CCU-M3/M3P) or 300 m (984 feet) (for the CCU-M7/M7P).

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.



#### 1-2. LOCATIONS AND FUNCTIONS OF PARTS



#### Lens mount

Attach here an optional zoom lens, microscope adaptor or endoscope adaptor depending on the intended application of the camera.

## 2 Mounting screw holes (one in the top of the camera body and another in the bottom)

To mount the camera on a building wall, ceiling or the like, or on a tripdod, use either of these holes and a U1/4"-20 UNC screw.

#### MENU (menu recali) button

Pressing this button recalls an operational settings menu (called as the menu in this manual; see page 1-16, which will be displayed on the screen of the monitor connected to the camera. Pressing again the button makes the menu disappear from the monitor screen.

#### DISPLAY/BARS (menu display control/color bars output) button

With the menu displayed: each press of this button switches the number of display lines between 1 and 8. With the menu not displayed: pressing this button makes the color bars signal be output.

#### **5** FUNCTION UP and DOWN (menu scroll) buttons

UP button: scrolls the menu display upwards.

DOWN button: scrolls the menu display downwards.

## **6** DATA UP/WHITE (higher setting selection/white balance adjustment) button

With the menu displayed: changes the setting value for the higher.

With the menu not displayed: activates the automatic white balance adjustment function.

#### LENS connector

When using a  $^2$ /<sub>3</sub>-inch zoom lens, connect the lens cable to this connector.

For a ½-inch zoom lens, there is no necessity to use this connector.

#### DATA DOWN/BLACK (lower setting selection/ black balance adjustment) button

With the menu displayed: changes the setting value for the lower.

With the menu not displayed: activates the automatic black balance adjustment function.

#### CCU (camera control unit) connector

Connect a camera control unit such as the CCU-M3/M3P/M7/M7P to this connector.

## **®** RGB/SYNC (RGB/sync signal output) connector Outputs RGB signals and a sync signal for them. Use a

Outputs RGB signals and a sync signal for them. Use a CCXC-9DB/CCXC-9DD/CCMC-9DS cable for connection.

Pin assignment



Pin No.	Signal	Pin No.	Signal
1	GND	6	VBS (Y) output
2	GND	7	SYNC output
3	RED output	8	NC
4	GREEN output		NC (C autaut)
5	BLUE output	9	NC (C output)

### GEN LOCK (reference sync signal input) connector

To make the camera operate in synchronization with a reference sync signal, input that signal to this connector.

### **®** DC IN/REMOTE (DC power input/remote control) connector

Connect a CMA-D1/D1CE camera adaptor (not supplied) to this connector.

- Use the CMA-D1 if your camera is the DXC-930\*.
- Use the CMA-D1CE if your camera is the DXC-93OP. This connector is also to be used for connection of an RM-930 remote control unit (not supplied).

## WIDEO OUT (composite video signal output) connector

The camera signal is output from this connector in the form of a composite signal.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.



#### Notes on Use

#### Mounting the lens

Any inappropriate way of mounting the lens may cause damages to both the camera and lens. Read carefully the instructions given in "Mounting the Lens" on page 1-5.

#### Power supply

Be sure to operate the camera on a 12 V DC power supplied via an appropriate camera adaptor (see page 1-6) or camera control unit (see page 1-10).

#### Do not disassemble

Do not open the casing. Be careful that touching any internal precision components may damage them.

#### Keep foreign matters out of the casing

Be careful not to spill water or other liquids on the camera, or not to get flammable or metallic material inside the casing. If used with any foreign matters inside, the camera may fail or be a cause of fire or electric shock.

#### Keep well ventilated

Do not block air circulation around the camera to prevent internal heat build-up.

#### Operating or storage location

Avoid operating or store the camera in the following locations:

- Extremely hot or cold locations (see "Specifications" on page 1-21 for operating and storage temperature ranges);
- Damp or dusty locations;
- Where it is exposed to rain;
- Locations subject to strong vibrations;
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.

#### **Transporting**

When you transport the camera, repack it as it was originally shipped. Do not discard the packing carton. It will afford maximum protection whenever you transport the camera.

#### Cleaning

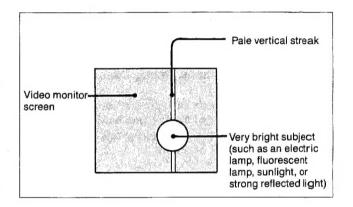
- To clean the external surfaces of the camera, use a soft, dry cloth. For severe stains, use a soft cloth dampened with a small quantity of neutral detergent, then wipe dry.
- Do not use volatile solvents such as alcohol, benzine and thinners; they may damage the surface finish.

#### **Typical CCD Phenomena**

Because of the high sensitivity of the CCD image sensors, the following phenomena may appear on the monitor screen while you are using the DXC-930/930P\* color camera. These phenomena do not mean that there is anything wrong with the camera.

#### Vertical smear

This may appear when shooting a very bright subject with most CCD cameras, but only seldom with this DXC-930/930P\*.



#### Aliasing

When shooting fine stripes, straight lines or similar patterns, the shot image may appear jagged.

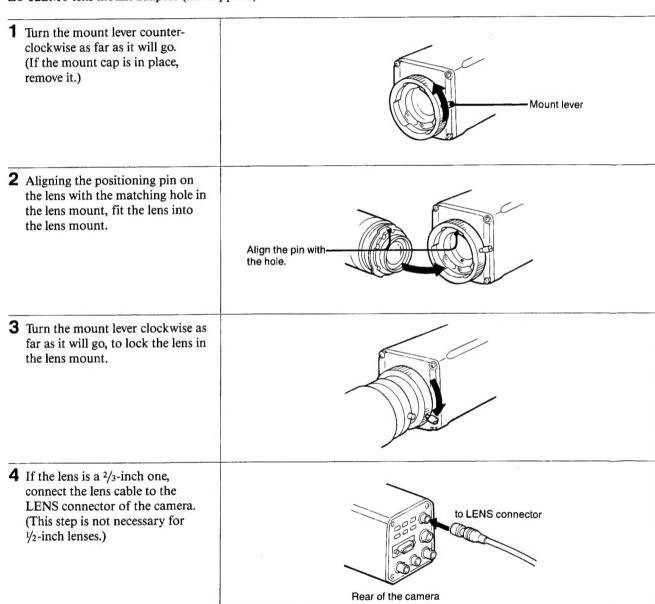
<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.

#### 1-3. MOUNTING THE LENS, MICROSCOPE ADAPTOR OR ENDOSCOPE ADAPTOR

#### **Mounting the Lens**

Lenses that can be directly mounted on the camera are of the ½-inch bayonet mount type only.

To mount a ½-inch lens, it is necessary to use an LO-32BMT lens mount adaptor (not supplied).



#### Mounting the Microscope Adaptor or Endoscope Adaptor

To attach the camera to a microscope, an operation microscope or an endoscope, it is necessary to mount an appropriate adaptor on the camera. The method for

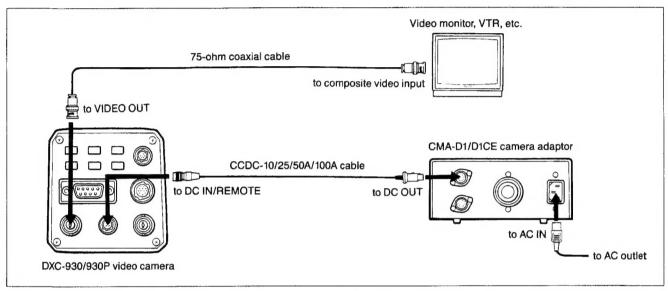
mounting these adaptors is the same as for lenses Also refer to the manual for the adaptor.

#### 1-4. CONNECTING TO VIDEO EQUIPMENT HAVING A COMPOSITE VIDEO INPUT

To connect the camera to video equipment having a composite video input connector, use the VIDEO OUT connector. To supply power to the camera, use an

appropriate camera adaptor:

- CMA-Dl camera adaptor for the DXC-930\*
- CMA-DICE camera adaptor for the DXC-930P.



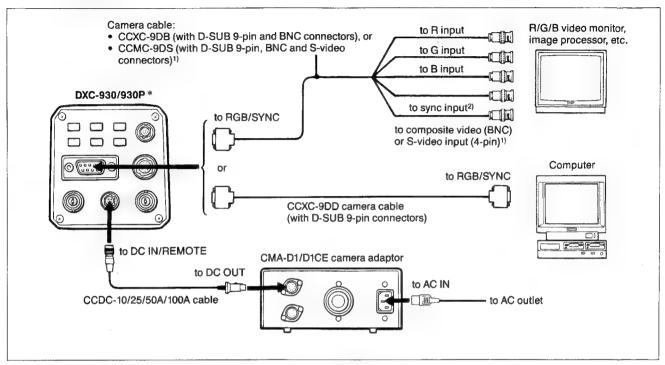
Connections using the VIDEO OUT connector

#### Note on use of camera adaptors

Although the CMA-D1/D1CE camera adaptor has two DC output connectors, the power consumption of the

DXC-930/930P \* does not allow two camera units to be connected to a single adaptor at a time. Be sure to use one camera adaptor for each DXC-930/930P \* unit.

#### 1-5. CONNECTING TO VIDEO EQUIPMENT HAVING R/G/B OR S-VIDEO INPUTS

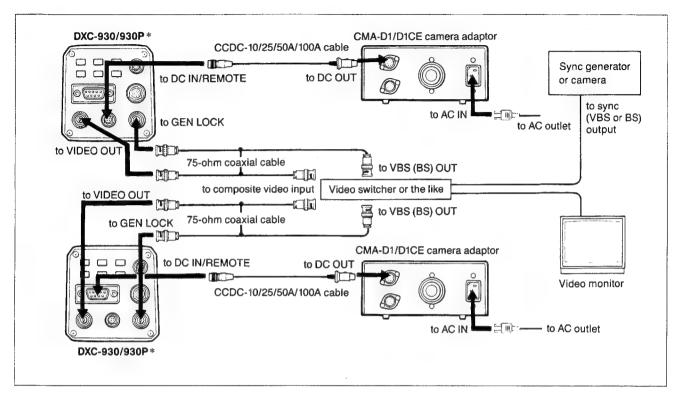


Connections using RGB/SYNC connector

- To connect separated Y and C signals to the S-video input connector of the video equipment, use a CCMC-9DS camera cable. For switching the camera output between VBS (composite video) and Y/C, see page 1-20.
- 2) When using a video monitor without sync signal input connector, you can make the camera output a sync-added G signal (G.SYNC). For details, see page 1-20.



#### 1-6. CONNECTIONS FOR MULTI-CAMERA SYSTEM



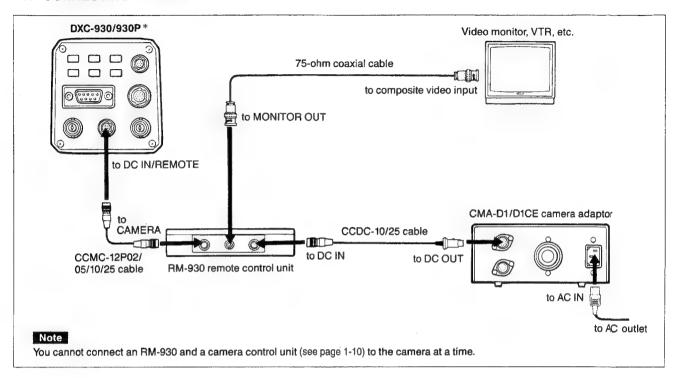
#### Note on multi-camera systems

When using two or more cameras by connecting to the same video switcher or the like, prevent camera-to-camera variations in picture tone by taking the following two measures:

- Supply the same sync signal to the GEN LOCK connectors of all cameras (see the above figure).
- Adjust the subcarrier and horizontal synchronization phases on all cameras. (For more details, see page 1-15).

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.

#### 1-7. CONNECTING A REMOTE CONTROL UNIT



## About the length of the cable line when using the RM-930

The lengthes of the CCMC and CCDC cables are:

CCMC- 5: 5 m (approx. 16 ft)

-10: 10 m (approx. 32 ft)

-25: 25 m (approx. 82 ft)

CCDC-10: 10 m (approx. 32 ft)

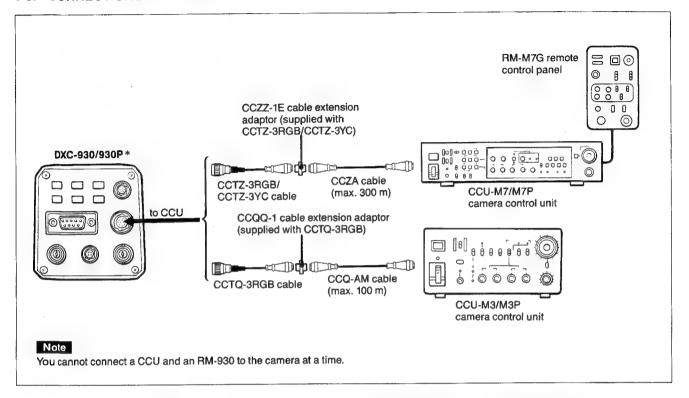
-25: 25 m (approx. 82 ft)

To prevent signal deteriorations, use CCMC and CCDC cables in either of the following combinations in terms of length.

CCMC cable	CCDC cable
CCMC-5	CCDC-10 or -25
CCMC-10 or -25	CCDC-10



#### 1-8. CONNECTIONG A CAMERA CONTROL UNIT AND A REMOTE CONTROL PANEL



#### When connecting a CCU-M3/M3P

To make video gain control possible, make the following setting on the camera:

GAIN: STEP STEP: 00 DB

Otherwise, changing the gain level will be impossible on the COLL M3/M3P

the CCU-M3/M3P.

See page 1-16 for the gain setting procedure.

#### When connecting a CCU-M7/M7P

To make video gain control possible, make the following settings on the camera:

GAIN: STEP STEP: 00 DB

Otherwise, changing the gain level will be impossible on the CCU-M7/M7P and only the gain setting on the camera will be effective.

See page 1-16 for the gain setting procedure.

For the CCD iris and electronic shutter, make the following settings on the camera:

CCD IRIS: OFF SHUTTER: OFF

Otherwise, controlling the electronic shutter will be impossible on the CCU-M7.

## To make it possible to change operational settings on the camera

Turn on the CCU while pressing the FUNCTION UP button of the camera. This allows you to use the menu on the camera to change settings for video gain, CCD iris, electronic shutter speed, and other functions not provided on the CCU (page 1-16). To pass the control back to the CCU after changing the settings on the camera, turn off the CCU and then turn it on again.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.



#### 1-9. INSTALLING THE CAMERA

#### Installing on a wall or ceiling

To install the camera on a wall or ceiling, use an appropriate support or bracket, and a mounting screw as specified below, which matches both the screw hole in the top and that in the bottom of the camera body.

For more details, consult your authorized Sony dealer.

#### Mounting on the tripod

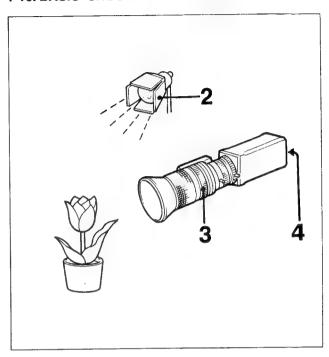
To mount the camera on a tripod, use the screw hole in the bottom of the camera body.

#### Mounting screw to be used



U1/4"-20 UNC ℓ: 4.5 ±0.2 mm (ISO Standard) 0.197 inches (ASA Standard)

#### 1-10. BASIC SHOOTING PROCEDURE



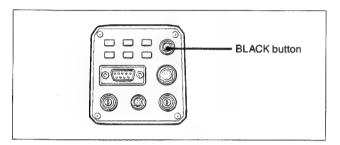
- 1 Turn on the power of the camera and all connected devices.
- 2 Illuminate the subject under proper lighting condition.
- 3 Aim the camera, and adjust the iris, focus and zoom.
- 4 Adjust the black balance and white balance.
- 5 Start the shooting.

#### 1-11. ADJUSTING THE BLACK BALANCE

In the following cases, it is necessary to adjust the black balance so that the lower video level portions of the output image are of correct tones:

- when using the camera for the first time;
- when using the camera after a week or longer period without using it; or
- when using the camera after the temperature has changed dramatically.

The black balance setting is preserved even when you turn off the power, and it is not normally necessary to re-adjust it after you turn on the power again.



- 1 Keep the camera picture displayed on the monitor screen.
  - If the color bars signal is displayed on the screen, press the BARS button to make it disappear.
  - If the menu is displayed on the screen, press the MENU button to make it disappear.

#### **2** Press the BLACK button.

Automatical black balance adjustment begins and is accomplished in several seconds. The "BLACK: OK" message appears on the monitor screen, and the adjusted black level is stored in memory automatically.

(Unless re-adjusted, the stored level will be preserved for about 10 years.)

- The iris of the lens is automatically closed when you
  press the BLACK button, and remains so until the
  end of the black balance adjustment. If you were
  manually controlling the lens iris before pressing the
  BLACK button in step 2, you need to reopen it after
  adjustment because otherwise it will remain closed.
- During the adjustment the gain control circuit operates, so the monitor screen flickers several times. Note that this is not a fault.

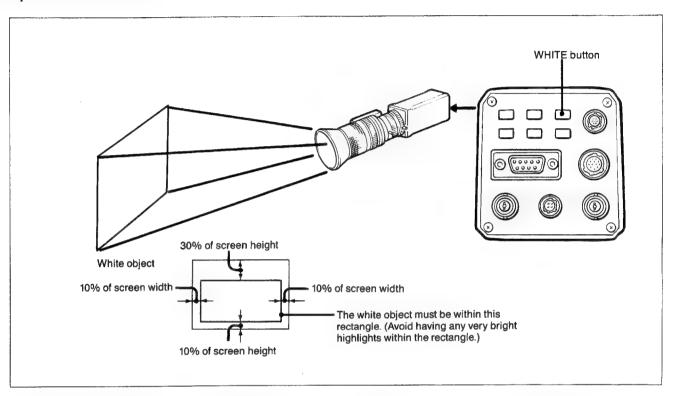
#### Black balance adjustment errors

If black balance adjustment has not been done successfully, either of the following two error messages appears on the monitor screen for about 4 seconds. Take the necessary action.

Error message	Meaning and Remedy
BLACK: NG	The camera failed to adjust the black balance for some reason.  Press the BLACK button again.
	Note
	If this message appears again and again, it is necessary to have the internal circuitry checked by qualified personnel.
BLACK: NG IRIS CLOSE ?	The camera was not able to adjust the black balance because of the light entering the lens.
	If you were controlling the lens iris     manually, close the iris and then press the     BLACK button again.
	If you are using a microscope adaptor without lens iris closing capability, see to it no light enters the lens and then press the BLACK button again.

#### 1-12, ADJUSTING THE WHITE BALANCE

Each time the lighting condition changes, you have to adjust the camera for white balance so that optimal color reproduction is obtained.



1 Using the menu, make the following settings for color temperature and white balance adjustment mode (see page 1-16):

C. TEMP: 3200K or 5600K (depending on the

lighting condition)

WHT.BAL: AUTO

- 2 Display the camera picture on the monitor screen.
  - If the color bar signal is displayed on the screen, press the BARS button to make it disappear.
  - If the menu is displayed on the screen, press the MENU button to make it disappear.
- 3 Set the lens iris control as follows:
  - For automatic iris control when using a lens with automatic iris control capability.
  - For an appropriate value of iris opening when using a manual iris control lens.

- 4 Place a white object in the same light as that which is falling on the subject to be shot, then point the camera at that object and zoom the lens.
  - The white object can be a piece of white paper or cloth, a white wall, or the like.
  - The requirements of the white area for the adjustment are as indicated in the above figure.
  - Avoid having any very bright highlights in the screen.
- 5 Press the WHITE button.

Automatical white adjustment begins and is accomplished in several seconds. The "WHITE: OK" message appears in the monitor screen. The adjusted white level is automatically stored in memory, and will be preserved for at least 10 years even if the power of the camera is turned off.

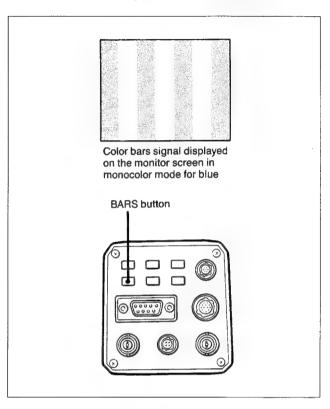
#### White balance adjustment errors

If white balance adjustment has not been done successfully, one of the following error messages appears on the monitor screen for about 4 seconds. Take the necessary action.

Error message	Meaning and Remedy
WHITE: NG LEVEL: LOW	The video level was too low.  Take one or more of the following actions and then press the WHITE button again.  Make the illumination brighter.  Widen the iris opening.  Increase the video gain.
WHITE: NG LEVEL; ???	The camera failed to adjust the white balance. Take one or both of the following actions and then try again.  • Get any very bright highlights out of the screen.  • Adjust the illumination.  Note  If this message appears again and again, it is necessary to have the internal circuitry checked by qualified personnel.
WHITE: NG C.TEMP: LOW	The color temperature was too low. Change the C.TEMP setting in the menu to 5600K and try again.
WHITE: NG C.TEMP: HIGH	The color temperature was too high. Change the C.TEMP setting in the menu to 3200K and try again.
WHITE: MANU	The current WHT.BAL setting in the menu is MANU. Change the WHT.BAL setting to AUTO.

#### 1-13. ADJUSTING THE VIDEO MONITOR

You can use the camera's color bar signal output to adjust the video monitor for optimal color reproduction.



- Press the BARS button.
   The camera outputs the color bar signal to the monitor.
- 2 Set the monitor for monocolor mode for blue.
- **3** Adjust the chroma and phase controls on the monitor so that all four blue bars are at the same brightness level.
- 4 Reset the monitor for normal (triplecolor) mode.
- 5 Press the BARS button again.
  The picture on the screen switches from color bars to that the camera is taking.
  - The iris of the lens is automatically closed when the camera begins to output the color bar signal, and remains so until when the camera stops outputting that signal. If you were manually controlling the lens iris before pressing the BARS button in step 1, you need to reopen it after the video monitor adjustment because it otherwise will remain closed.



#### 1-14. ADJUSTING THE PICTURE TONE ON A MULTI-CAMERA SYSTEM

When configuring a multi-camera system, it is necessary to adjust all cameras to prevent camera-to-camera variations in picture tone.

Supply the same sync signal to all cameras (see page 1-8), then make adjustments as instructed below.

#### When Connecting the Cameras to Video Equipment with Phase Indication Capability

When the cameras are connected to a special effect generator, a chroma keyer or other video equipment having a phase indication capability, the basic adjustment procedure is as follows.

- 1 Activate the phase indication capability of the connected video equipment.
- 2 Adjust the horizontal phase using the H. PHASE function of the menu (see page 1-20).
- Adjust the subcarrier phase.

  First make a coarse adjustment for 0° or 180° using the 0/180 item of the menu, then a fine adjustment using the SC item. (See page 1-20.)

For more details, refer to the instructions manual for the connected video equipment with phase indication capability.

## When Not Connecting the Cameras to Video Equipment with Phase Indication Capability

Use one of the cameras as reference camera and adjust the other cameras to the reference camera one by one.

- 1 Adjust the horizontal phase.
  Using the H. PHASE function of the menu (see page 1-20), make adjustment so that the reference video signal and the output signal have the same horizontal sync phase. Use a waveform monitor or an oscilloscope to check the phase.
- Adjust the subcarrier phase.

  First make a coarse adjustment for 0° or 180° using the 0/180 item of the menu, then make adjustment using the SC item so that the reference video signal and the output video signal have the same subcarrier phase. (See page 1-20.)
  - Use a vectorscope or the wiping capability of a special effect generator so that the reference camera picture and the picture from the camera to be adjusted are both displayed on the monitor screen in vertical or horizontal juxtaposition.



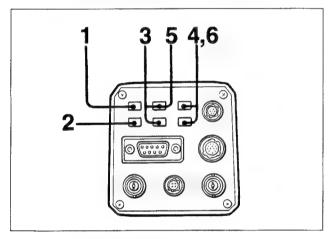
#### 1-15. PROCEDURE FOR CHANGING SETTINGS

You can easily change any camera operational settings through simple button manipulation while seeing the menu display on the monitor screen.

This section describes how to change settings by taking up video gain and white balance as examples, which are two of the adjustment items requiring a change of setting most frequently. All the items whose settings can be changed using the menu are listed up on page 1-18.

## Example 1: Changing the Video Gain Setting

When shooting in very low light, fully opening the lens iris may not be sufficient to produce acceptably bright pictures. In such case, you can obtain pictures of adequate brightness by raising the video gain setting.



1 Press the MENU button.
The menu display appears on the monitor screen.

Sele	cted-line indica	tor
1	GAIN	STEP
	STEP	00DB
	C.TEMP	3200K
	WHT.BAL	AUTO
	R.GAIN	+00
	B.GAIN	+00
	CCD IRIS	OFF
	SHUTTER	OFF

Menu display (example)

- **2** Press the DISPLAY button. Each press of this button switches the number of display lines between 1 and 8.
- 3 Using the FUNCTION UP and FUNCTION DOWN buttons, select the line showing the desired item.

  The FUNCTION UP button scrolls the menu display upwards, and FUNCTION DOWN, downwards.

  In this example, select the line showing the GAIN item.

GAIN	STEP	
STEP	00DB	

4 Using the DATA UP and DATA DOWN buttons, select the desired setting.

AGC: for automatical control of video gain.

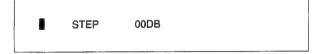
This selection means the end of the procedure.

STEP: for setting the video gain to the desired level.

Go to step 5.

1	GAIN	STEP
_	STEP	OODB

5 Using the FUNCTION UP button, select the cursor on the line showing the STEP item.



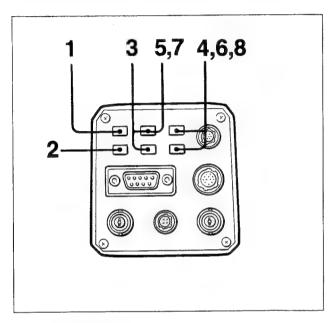
6 Using the DATA UP and DATA DOWN buttons, set the gain to the desired level.

You can set the gain to any value in the range of 0 to 18.

STEP	(00 to 18) DB	

## Example 2: Changing the White Balance Setting

The procedure for manual adjustment of white balance is as follows. For automatical adjustment, see page 1-13.



1 Press the MENU button.
The menu display appears on the monitor screen.

Selec	ted-line indicate	or	
	GAIN	STEP	
	STEP	00DB	
	C.TEMP	3200K	
	WHT.BAL	AUTO	
	R.GAIN	+00	
	B.GAIN	+00	
	CCD IRIS	OFF	
	SHUTTER	OFF	

Menu display (example)

Press the DISPLAY button. Each press of this button switches the number of display lines between 1 and 8. 3 Using the FUNCTION UP and FUNCTION DOWN buttons, select the line showing desired item. In this example, position the cursor on the line showing the WHT.BAL item.

WHT.BAL	AUTO	
R.GAIN	+00	
B.GAIN	+00	

**4** Using the DATA UP and DATA DOWN buttons, select MANU.

**AUTO:** for automatical adjustment. You can now use the automatical white balancing function. (See page 1-13.)

MANU: for manual adjustment. Go to step 5.

WHT.BAL	AUTO	
R.GAIN	+00	
B.GAIN	+00	

5 Using the FUNCTION UP button, select the line showing the R.GAIN item.

	R.GAIN +00
--	------------

6 Using the DATA UP and DATA DOWN buttons, set the red gain to the desired level. You can set the gain to any value in the range of −99 to +99.

•	R.GAIN B.GAIN	(-99 to +99) +00

7 Using the FUNCTION UP button, select the line showing the B.GAIN item.

ı	B.GAIN	+00	

8 Using the DATA UP and DATA DOWN button, set the blue gain to the desired level.

You can set the gain to any value in the range of −99 to +99.

ı	B.GAIN	(-99 to +99)	

#### Basic principles of the operation to change settings

As is understandable from the two examples given above, the basic principle of the operation to change settings can be summarized as follows.

- 1 Press the MENU button to display the menu.
- 2 Select a menu item with the FUNCTION UP and FUNCTION DOWN buttons.
- 3 Select the desired setting with the DATA UP and DATA DOWN buttons.

Selec	ted-line indicate	or	
	GAIN	STEP	
	STEP	00DB	
	C.TEMP	3200K	
	WHT.BAL	AUTO	
	R.GAIN	+00	
	B.GAIN	+00	
	CCD IRIS	OFF	
	SHUTTER	OFF	

#### Initial Setting or Menu item setting range setting M.PED\*1 -99 to +99 +00 (master pedestal) DTL -99 to +99+00(detail) H.PHASE\*1 -- 99 to +99 +00 (Change of setting is enabled if (horizontal phase) a sync signal is input to GEN LOCK connector.) SC\*1 -99 to +99+00 (subcarrier phase) 0/180 0 or 180 0 (Change of setting is enabled if a sync signal is input to GEN LOCK connector.) ON **GAMMA** ON or OFF (gamma compensation) **G.SYNC** ON or OFF ON (G with sync) FLD/FRM FLD or FRM FLD (field/frame) D-SUB YC or VBS **VBS** (RGB/SYNC output signal format)

## 1-16. SETTINGS THAT CAN BE CHANGED (LIST OF MENU ITEMS)

Menu item	Setting or setting range	Initial setting
GAIN (video gain)	AGC or STEP	STEP
STEP	0 to 18 dB (Change of setting is enabled by selection of STEP on GAIN.)	0 dB
C.TEMP (color temperature)	3200K or 5600K	3200K
WHT.BAL (white balance)	AUTO or MANU	AUTO
R.GAIN*1 B.GAIN*1	- 99 to + 99 - 99 to + 99 (Change of setting is enabled by selection of MANU on WHT.BAL.)	+00+00
CCD IRIS	ON or OFF	OFF
SHUTTER (electronic shutter)	OFF, STEP, or MANU For settings, see page 1-20.	OFF
STEP	FL, or 1/125 to 1/10000 sec. (Change of setting is enabled by selection of STEP on SHUTTER.)	FL
MANU	Functions only when CCD IRIS is set to OFF. (Change of setting is enabled by selection of MANU on SHUTTER.)	OFF

<sup>\*1</sup> To restore the initial, or central, setting (+00) for this item, press the DATA UP and DATA DOWN buttons simultaneously.

The following are the descriptions of the menu items and their settings.

#### GAIN (video gain)

AGC: for automatical control of video gain.

The gain of the video signal circuitry is automatically controlled depending on the brightness of the subject. This function is useful when the illuminance of the subject varies more or less dramatically.

STEP: for setting the video gain to the desired level.

Use this function for shooting in so dark places that fully opening the lens iris can still not give an acceptably bright image. The gain level can be set in the range of 0 to 18 dB in units of 1 dB.

#### C.TEMP (color temperature)

**3200K:** for indoor shooting. **5600K:** for outdoor shooting.

#### WHT.BAL (white balance)

**AUTO:** for automatical adjustment of white balance described on page 1-13.

MANU: for manual adjustment of white balance. Both red gain (R.GAIN) and blue gain (B: GAIN) are adjustable.

#### **CCD IRIS**

ON: When an excessive amount of light passes through the lens, this function increases the shutter speed automatically to nearly the same effect that the lens iris is narrowed 3 stops down.

In microscope shootings using a microscope adaptor without incident light control capability, for example, an amount of incident light which is not too much for a human eye will often be so for a video camera. With CCD IRIS set to ON, an excessive amount of incident light is automatically decreased to an appropriate level for the video camera. In another example, if there is a very bright object (such as snow, or sea water reflecting sunlight) within the range of view of the lens, the incident light is automatically decreased to a certain level if of course the lens has an automatical iris control capability. Also in such case, CCD IRIS is useful to give a further decrease of incident light.

**OFF:** for shooting in normal lighting condition. Also use this setting when:

- The picture flickers on the monitor screen. This may occur when using the DXC-930\* with lighting power of 50 Hz or the DXC-930P, of 60 Hz. In such case, set CCD IRIS to OFF and shutter speed to FL. (See the next page.)
- The camera is used under fluorescent light. This may cause slow variations in color to the picture. If the degree of color variations is unacceptable, set CCD IRIS to OFF.

#### **SHUTTER** (electronic shutter)

The electronic shutter allows you to obtain blur-free pictures of a fast moving subject, and if used combinedly with a frame memory device, adequately bright pictures of low-illuminated subjects.

Note that the SHUTTER function is effective only when CCD IRIS is set to OFF.

**OFF:** for inactivating the electronic shutter.

**STEP:** for setting the shutter speed to one of the following eight: FL, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, and 1/10000 sec.

FL gives flickerless pictures. When using the DXC-930\* with lighting power of 50 Hz or the DXC-930P, of 60 Hz, setting SHUTTER to FL gives you flickerless pictures even under fluorescent light.

MANU: for adjusting the shutter speed in units of frame or horizontal scan cycle time (H) in the following rage.

#### DXC-930\*:

In units of frame		In units of H
In FLD mode*2: 255 to 001	OFF	260/525 to 1/525
In FRM mode*2: 256 to 002	1	260/525 to 1/525

#### DXC-930P:

In units of frame		In units of H
In FLD mode*2: 255 to 001	OFF	310/625 to 1/625
In FRM mode*2: 256 to 002	]	310/025 10 1/025

<sup>\*2</sup> About FLD and FRM modes, see page 1-20.

Adjusting the shutter speed in units of frame: for example, if the setting is 050 (equivalent to about 1.7 seconds with DXC-930\* and 2 seconds with DXC-930P), the whole amount of video signal accumulated during this set time will be output in the form of one complete picture (or one still frame) at intervals of about 1.7 seconds or 2 seconds depending on the camera. These pictures, which contain 50 frames of video information, are much brighter than normal one-frame pictures. Therefore, this mode of setting the shutter speed is very useful for shooting a low-illuminance subject in a dark place. You can make timing pulses for taking ou still pictures be output from the RGB/SYNC connector by changing the setting of the internal SYNC switch (see the figure). You can use this function advanageously for image processing or image analysis by synchronizing an external frame memory with the timing pulses to take out still pictures.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960ND.



Adjusting the shutter speed in units of H: with the DXC-930\*, 1 H is 63.56 μsec. and with the DXC-930P, 64.0 μsec.

This function reduces a noise which appears as horizontal stripes when shooting computer screen displays for example (Clear Scan function). While checking the image on the monitor screen, you can make adjustment using the DATA UP and DATA DOWN buttons to obtain a picture showing the least possible horizontal stripe noise.

## Calculating shutter speeds from SHUTTER MANU settings

Example 1: When the frame setting is 005:

DXC-930\*: 005 × 1/30 sec. = 0.1666 sec.

DXC-930P: 005 × 1/25 sec. = 0.2 sec.

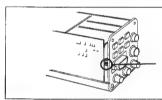
Example 2: When the H setting is 250/525

(DXC-930\*) or 250/625 (DXC-930P):

DXC-930\*: 250 × 63.56 µsec. + 34.78 µsec.

(constant) =  $15924.78 \mu sec.$ = approx. 0.016 sec.

DXC-930P:  $250 \times 64 \,\mu\text{sec.} + 35.6 \,\mu\text{sec.}$  (constant) =  $16035.6 \,\mu\text{sec.} = \text{approx.} \ 0.016 \,\text{sec.}$ 



SYNC switch
For details, refer to
SECTION 2 TECHNICAL
INFORMATION.

#### Note

When SHUTTER is set to MANU, do not use the AGC function or the white balancing function.

#### M.PED (master pedestal)

Normally set this to +00.

When the black parts of the picture are too dull, you can make them look sharp by adjusting the the master black level. Use of a waveform monitor will make the adjustment easier.

#### DTL (detail)

You can use the DTL function to adjust the sharpness of the outlines of objects in the reproduced picture. A higher set value makes the picture look sharper with more detail on the image outlines, and a lower value makes the picture look softer with less detail.

#### H.PHASE (horizontal phase)

When an external reference sync signal to gen-lock the camera is input to the GEN LOCK connector, the camera operates at the frequency of that reference signal. You can use this H.PHASE function to perfectly synchronize the camera operation with the reference signal to the level of horizontal phase.

#### SC and 0/180 (subcarrier phase)

When gen-locking the camera, use the SC and 1/180 functions to adjust the subcarrier phase. First use 1/180 for coarse adjustment and then SC for fine adjustment.

#### **GAMMA** (gamma compensation)

**ON:** for normal use of the camera. The image reproduction characteristics of the monitor CRT are properly compensated for automatically to give pictures of natural tones.

**OFF:** for producing pictures convenient for image processing or image analysis. The video signal is output linearly from the CCD without gamma compensation.

#### G.SYNC (G with sync)

ON: for using a video monitor without sync input connector. A sync-added G signal can be output from the RGB/SYNC connector of the camera.

**OFF:** normal setting. The G signal is output from the RGB/SYNC without sync signal.

#### FLD/FRM (field/frame)

FLD: for shooting fast moving subjects. The CCD accumulates and outputs the charges field by field to give pictures showing a minimum blur even when the subject is fast moving.

FRM: for producing pictures with the highest possible vertical resolution. The CCD accumulates and outputs the charges frame by frame. Select this setting when using the camera with measuring instruments, image processing or image analysis systems equipped with a frame memory, or still image processing systems.

#### D-SUB (RGB/SYNC output signal format)

This allows you to select the output signal format for the RGB/SYNC connector.

Y/C: for separated Y and C signals. VBS: for composite video signal.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.

#### 1-17. SPECIFICATIONS

Imager ½-inch CCD, interline transfer type

Effective picture elements

DXC-930\*: 768 (H) × 494 (V)

DXC-930P: 768 (H) × 494 (V)

Synchronization Internal/external (VBS) synchro-

nization, automatical switching

DXC-930\*: EIA standard format DXC-930P: PAL format

Horizontal scanning

Signal format

DXC-930\*: 525 lines, 2:1 interlace

DXC-930P: 625 lines, 2:1 interlace

Scanning frequency

DXC-930 \*: Horizontal: 15.734 kHz

Vertical: 59.94 Hz

DXC-930P: Horizontal: 15.625 kHz

Vertical: 50 Hz

Horizontal resolution

720 TV lines

Sensitivity DXC-930\*: 2,000 lux (f/5.6, 3200 K)

DXC-930P: 2,000 lux (f/5, 3200 K)

Signal-to-noise ratio

DXC-930\*: 58 dB

DXC-930P: 56 dB

Lens mount

1/2-inch bayonet type

Gain control

AutomaticManual: 0 to 18 dB in units of 1 dB

White balancing • Automatical

• Manual: red gain and blue gain

adjustable indivudually

CCD iris control On/off switchable

Electronic shutter speed

Adjustable in the range of 1/10,000 to about 8.5 sec (DXC-930\*) or 10 sec

(DXC-930P)

Gamma compensation

On/off switchable

Charge accumulation mode

Switchable between field and frame

modes

Output signals Video:

Composite: 1.0 Vp-p, 75 ohms R/G/B: 0.7 Vp-p, 75 ohms Y: 1.0 Vp-p, 75 ohms

C: Same level as VBS chroma,

75 ohms

Sync: 2.0 Vp-p, 75 ohms

Input/output connectors

VIDEO OUT: BNC, 75 ohms,

unbalanced

GEN LOCK: BNC, 75 ohms,

unbalanced

DC IN/REMOTE: 12-pin RGB/SYNC: D-SUB 9-pin LENS: 9-pin, for <sup>2</sup>/<sub>3</sub>-inch lens

CCU: 20-pin

Power supply

12 V DC

Power consumption

7.8 W Operating temperature

-5 to +45 °C (23 to 113°F)

Storage temperature

 $-20 \text{ to } +60^{\circ}\text{C} (-4 \text{ to } +140^{\circ}\text{F})$ 

Demensions (w/h/p)

 $70 \times 72 \times 123.5 \text{ mm}$ 

 $(2^{7/8} \times 2^{7/8} \times 4^{7/8} \text{ inches})$ 

Weight

About 670 g (1 lb 8 oz)

Design and specifications are subject to change without notice.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960/1D.

#### 1-18. RECOMMENDED EQUIPMENT

#### Lenses

VCL-707BXM (automatic zoom, 7 × )

VCL-712BXEA (automatic zoom, 12 ×)

VCL-716BXEA (automatic zoom, 16 ×)

#### Camera adaptors and camera remote control units

CMA-D1 camera adaptor (for DXC-930\*)

CMA-DICE camera adaptor (for DXC-930P)

RM-930 camera remote control unit (with CCMC cable)

#### Microscope adaptors and couplers

MVA-40 microscope adaptor (with automatic dimmer)

MVA-41 microscope adaptor

MVAC-33-O microscope coupler (for Olympus microscopes)

MVAC-33-N microscope coupler (for Nikon microscopes)

#### Camera control units

CCU-M7/M7P CCU-M3/M3P

#### Power supply cables

CCDC series (length: 10 m (32 ft) or 25 m (82 ft)) CCDCA series (length: 50 m (164 ft) or 100 m (328 ft))

#### CCU connection cables

CCTQ-3RGB (for CCU-M3/M3P, with CCQQ-1 extension connector, length: 3 m (9 ft 10 in))

CCTZ-3RGB (for CCU-M7/M7P, R/G/B transmission, with CCZZ-1 extension connector, length: 3 m (9 ft 10 in))

CCTZ-3YC (for CCU-M7/M7P, Y/C transmission, with CCZZ-1 extension connector, length: 3 m (9 ft 10 in))

#### **Extension cables for CCU connection**

CCQ-AM (for CCU-M3/M3P, max. length: 100 m

CCZA (for CCU-M7/M7P, max. length: 300 m (984 ft))

#### Camera cables

CCXC-9DB (with a D-SUB 9-pin connector at one end, and five BNC connectors at the other)

CCXC-9DD (with a D-SUB 9-pin connector at each end)
CCMC-9DS (with a D-SUB 9-pin connector, and four
BNC and one S- video connectors at the other)

#### 1-19. GLOSSARY

Some of the technical terms used most often in video camera technology and operation are explained hereunder.

#### **Bayonet mount**

A type of lens mount. The lens can be inserted into the lens mount and fixed in place quickly by rotating the mount lever.

#### Black balancing

To adjust a video camera while closing the lens iris completely so that the portions of the camera signal at the black level represent absolute black.

The pedestal level is adjusted so that the black levels of the R, G and B signals are equal. See "Pedestal level."

#### CCD

Abbreviation of Charge-Coupled Device. A semiconductor imaging device to convert input light levels into electrical charges, which are once stored and then output in the form of electrical voltage variations.

#### Color bar signal

A test signal to be displayed as vertical bars of different colors on a color video monitor. Used to check chrominance functions of television and video equipment, for example to check hue and saturation.

#### Color temperature

The temperature in Kelvins (K) to represent the color of a light source, determined by heating a perfectly black body until its color matches that of the light source. Color temperature is higher when the color is bluish and lower when reddish.

#### Color temperature conversion

Conversion of the color temperature of a light source to a particular reference color temperature (3200K for this camera, for example). See "Color temperature."

#### Field

One-half of a complete television or video camera picture (or frame) containing all of the odd or even scanning lines of the picture. See "Frame".

#### Frame

A single complete television or video camera picture consisting of two interlaced fields. See "Field."

#### Gen-lock

Abbreviation of Generator Lock. Locking the internal sync generator of a camera with an external reference sync signal.

<sup>\*</sup> The DXC-930 can be replaced with the DXC-960MD.

#### Horizontal resolution

The capability of a camera to resolve detail in a horizontal direction. It is usually expressed as the number of vertical lines which can be distinguished on the monitor screen when shooting a test chart.

#### Iris

A diaphragm which controls the amount of light passing through the lens.

#### Pedestal level

Reference video level. Since signals close to the reference black level of the video signal contain noise, the pedestal level is set at about 10% above the blanking level.

#### Shutter speed

The length of time a shutter remains open. The faster the shutter speed, the less the shot image blurs but the darker it looks.

#### Subcarrier

The color information signal contained in a video signal. Its phase is for hue and its amplitude, color saturation.

#### **VBS**

Abbreviation of Video, Burst and Sync. A composite signal consisting of video signal, burst signal and sync signal.

#### Video gain

Amount of amplification for video signals, expressed in decibels (dB).

#### White balancing

In the light of a particular color temperature, to adjust the white levels of the R, G and B signals of a video camera so that any white subject shot in that light is reproduced as a truly white image. See "Color temperature."



# SECTION 2 TECHNICAL INFORMATION

#### 2-1. SWITCHES SETTING ON THE BOARD

#### AT-69 BOARD

• SW1 (OPE/ADJ)

When adjusting the electronic controls, the S1 switch on the AT-69 board set to "ADJ" position.

Normally set to "OPE" position.

• SW2 (PT/ZF)

Normally set to "ZF" position.

When using the special system, for example, PAN ans TILT control by the Camera Control Unit, set to "PT" position.

#### **CN-579 BOARD**

• SW7 (SYNC/SG1) Normally set to "SYNC" position.

SYNC: The sychronizing signal outputs from 9P D-SUB connector.

SGI: The shutter speed can be set in units of frame. Setting this mode is very effective for shooting a low luminance subject in a dark place. Because a video signal is stored during a frame period, a brighter video signal can be obtained.

And the image processing or image analysis can be performed by synchronizing an external frame memory with the timing pulses and memorizing a video signal. As a result, the pulse synchronized with the read timing pulse is output.

#### 2-2. CONNECTOR/CABLE

#### 2-2-1. Connector Input/Output Signals

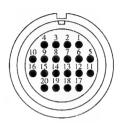
#### LENS (6P, FEMALE)



#### (EXT VIEW)

PIN NO.	SIGNAL	SPECIFICATION
1	NC	
2	NC	
3	UNREG (G)	
4	IRIS CLOSE	5 V (COMPULSORY AUTO)
5	IRIS CONT	2.6 V (CLOSE)~7.6 V (OPEN)
6	UNREG (+)	+12 V

#### CCU, (20P MALE)



#### (EXT VIEW)

PIN NO.	SIGNAL	SPECIFICATION
1	UNREG OUT (+)	+12 V
2	UNREG OUT (G)	
3	VBS OUT (X)	1 V. p-p
4	(G)	
5	R(X)	0.7 V p-p
6	R (G)	
7	G (X)	0.7 V p-p
8	G (G)	
9	B (X)	0.7 V p-p
10	B (G)	
11	Y (X)	1 V p-p
12	Y (G)	
13	C (X)	NTSC: 0.28 V p-p PAL: 0.3 V p-p
14	C (G)	
15	GENLOCK (CCU) IN (X)	1V p-p
16	GENLOCK (CCU) IN (G)	
17	SERIAL DATA IN(X)	
18	SERIAL DATA IN (G)	
19	SENSE (+)	
20	SENSE (-)	

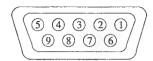
#### DC IN/REMOTE (12P, MALE)



(EXT VIEW)

PIN NO.	SIGNAL	SPECIFICATION
1	UNREG (G)	
2	UNREG (+)	+12 V
3	VBS (G)	
4	VBS (+)	
5	FOCUS CONT	0 to 5 V
6	IRIS CONT	0 to 5 V
7	CAM/REM CTL	CAM: 5 V REM: 0 V
8	ZOOM CONT	0 to 5 V
9	MODE	
10	UNREG (G)	
11	UNREG (+)	+12 V
12	IRIS A/M	AUTO: 5 V MANU: 0 V

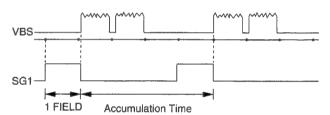
#### D-SUB (9P)



(EXT VIEW)

PIN NO.	SIGNAL	SPECIFICATION
1	VBS (G)	
2	R/G/B (G)	
3	R(X)	0.7 V p-p (75 ohms)
4	G (X)	0.7 V p-p (75 ohms)
5	B (X)	0.7 V p-p (75 ohms)
6	VBS/Y (X)	1 V p-p (75 ohms)
7	SYNC (X) * 2 V p-p (75 ohm	
8	SYNC (G)	
9	C(X)/—	

\* SG1 output waveform at pin 7 is shown when SYNC switch SW7/CN board is set to SG1 (Output Timing Pulse) position. The signal is only output during long-time accumulation mode.



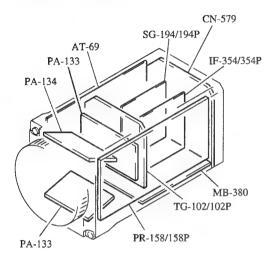
#### 2-2-2. Connector

Connection made with the connector panels during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equipment parts;

Connector function		Parts No. , and name of connector with cable	
LENS	(6P, FEMALE)	1-560-078-41	PLUG, 6P MALE
CCU	(20P, MALE)	1-691-747-11	PLUG, 20P FEMALE
DC IN/REMOTE	(12P, MALE)	1-562-356-11	PLUG, 12P FEMALE
D SUB	(9P)	• 1-566-354-11 PLUG, DSUB 9P MALE • JAE DEU-9PF-F0 equality	
VIDEO OUT GENLOCK	(BNC)	1-560-069-11	PLUG, BNC

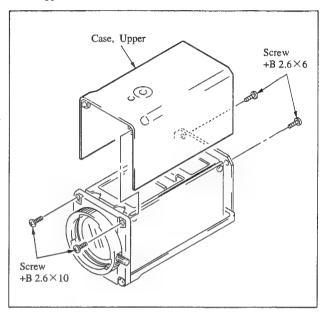
# SECTION 3 SERVICE INFORMATION

#### 3-1. BOARD LAYOUT

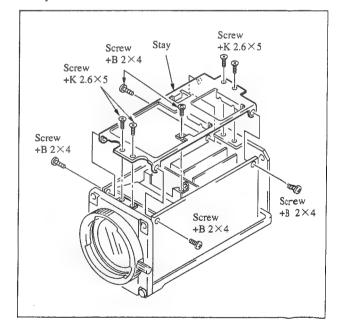


#### 3-2. REMOVAL OF CABINET

1. Remove the four screws (+B  $2.6\times10$ , +B  $2.6\times6$ ) and then remove the upper case.

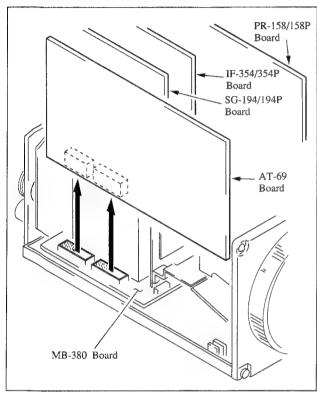


2. Remove the nine screws (+B 2×4, +K 2×4) and then remove the stay.

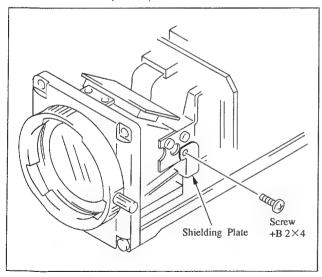


#### 3-3. REMOVAL OF CCD BLOCK

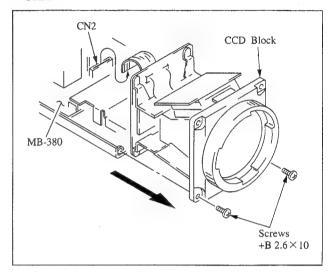
- 1. Remove the upper case and stay, referring to the Section 3-2 "REMOVAL OF CABINET".
- 2. Pull out the PR-158/158P, IF-354/IF-354P, SG-194/194P, and AT-69 boards from the MB-380 board.



3. Remove the screw  $(+B 2\times4)$ .

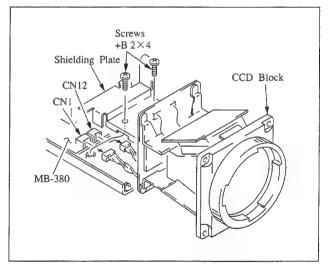


- 4. Remove the two screws (+B 2.6×10) and pull out the CCD block from the main body.
- Disconnect the flexible board from the CN2 on the MB-380 board.



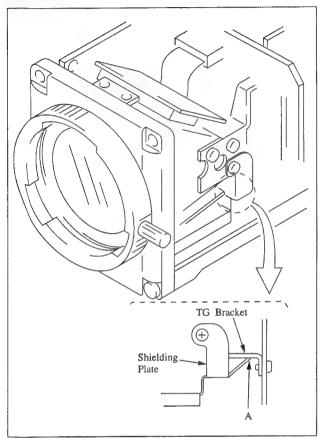
Remove the two screws (+B 2×4) and then remove the shielding plate.

Disconnect the harness from the CN1 and CN12 on the MB-380 board, and then remove the CCD block.



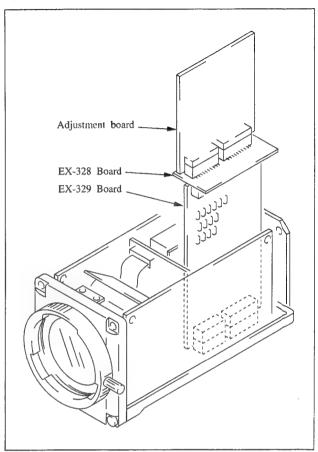
## <Pre><Pre>cautions on mounting the shielding plate>

When installing the shielding plate after replacement of the CCD block, confirm the TG blacket touches a portion "A" of the sielding plate.

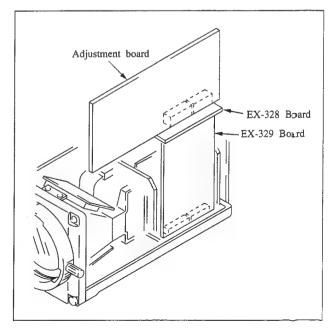


#### 3-4. HOW TO USE AN EXTENSION BOARD

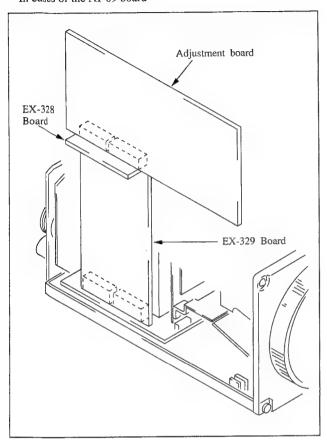
• In cases of the SG-194/194P board and the IF-354/354P board



• In cases of the PR-158/158P board



#### • In cases of the AT-69 board



# SECTION 4 CIRCUIT OPERATION DESCRIPTION

#### 4-1. PA-133 AND PA-134 BOARDS

The PA-133 and PA-134 boards have a CCD imager and converts incident light into an electric signal. They also extract a photoelectrically converted video signal by CDS.

From the viewpoint of the structure in channel B, these boards are classified into two types because the signal lines of the CCD driving clock from the TG-102/102P board and the power differ in the draw-out direction. However, the two boards are much the same in circuit configuration.

The PA-133 board is used in channels R and G, and the PA-134 board in channel B.

The light separated into the three primary colors via an optical system is sent to CCD imager IC1 (ICX038AT-1) and converted into an electric signal. Photosensors are arranged on the surface of a CCD chip. The number of photosensors in the horizontal direction is 811, and that in the vertical direction is 508. 411,988 photosensors are arranged in total. The number of effective pixels is 768 in the horizontal direction and 494 in the vertical direction (379,392 in total).

The incident light is converted into an electric charge corresponding to the brightness of light in a photosensor block. The converted charge is read from the photosensor block to the transfer block and sent to the output block. The transfer block is classified into a vertical transfer block and horizontal transfer block. As shown in Fig. 1, 811 vertical transfer blocks are arranged

in the vertical direction of the screen, and one horizontal transfer block in the horizontal direction of the screen (the uppermost part in Fig. 1). The charges converted in photosensors are transferred to the vertical transfer blocks adjacent to each photosensor for every field in the field read mode (every for frame in the frame read mode). The charges transferred to each vertical transfer block are vertically transferred in parallel using vertical transfer clocks V1 through V4 and sent sequentially to the horizontal transfer block. The horizontal transfer block transfers the charges horizontally using horizontal transfer clocks H1 and H2 (with frequency of 910 fH) and sends them to the output block. The charges are then output from pin 10 (CCD OUT) of IC1. The horizontal and vertical transfer clocks are sent from the TG-102/102P board.

The charge of an output signal from IC1 is converted into a voltage using a capacitor in the output block, then output. The output signal is input through buffer Q2 (emitter follower) to pins 2 and 3 of IC4 (IC3 for the PA-134 board) (CXA-1439M). IC4 is a CDS IC. Using a sampling pulse input to pins 5 (SHD) and 6 (SHP), IC4 performs the sample and hold operation and separates a signal. It then outputs a video signal from pin 8 as a CDS OUT signal. The output signal is input through A1 (FPC) and TG-102/102P board to the PR-158/158P board.

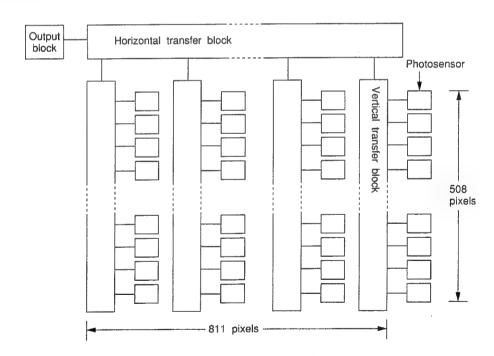


Fig. 1 Internal Structure of CCD

#### 4-2. TG-102/102P BOARD

The TG-102/102P board consists of the circuits below.

- · CCD drive timing signal generator
  - ...... IC2 and IC7 (CXD1256AR)
- · CCD vertical transfer clock driver
  - ...... IC1, IC3 and IC6 (CXD1250N)
- CCD horizontal transfer clock driver (for channels R and B)
  - ...... IC8 (MC74AC04MR)
- 910 fh phase operation circuit
  - ...... IC4 (SN74HC74ANS) and IC5 (SN74HC00ANS)
- LH1 negative power supply circuit
- · RGL bias adjustment circuit
- Vsub voltage supply circuit

#### (1) CCD drive timing signal generator

IC2 and IC7 (CXD1256AR) generate a clock, sample and hold pulse, and clamp pulse required for CCD driving by inputting a 1820 ft clock and HD and VD pulses output from a sync signal generator. DXC-930/930P/960MD uses spatial offset technology for CCD adhesion. The phases of CCD driving clocks must be shifted 180 degrees between channels G, and R and B. Therefore, IC2 is used for channel G, and IC7 for channels R and B.

Each clock used in the DXC-930/930P/960MD is described below.

#### • CL:

910 fH clock. Driven by IC4 and IC5 so that the phase is shifted 180 degrees between channels G, and R and B.

#### • H1 and H2:

Horizontal transfer block driving clock of CCD imager. Channel G is driven directly, and channels R and B drive IC8 as a driver.

#### • LH1:

Horizontal transfer block's final driving clock of CCD imager.

#### • XV1 to XV4, XSG1, and XSG1:

Vertical transfer block driving clock of CCD imager. These clocks are sent through drivers IC1, IC3, and IC6 to the PA-133 and PA-134 board.

#### · Xsua:

Charge sweep pulse for electronic shutter control. This clock is sent through drivers IC1, IC3, and IC6 to the PA-133 and PA-134 board. The shutter speed is controlled by a microcomputer on the AT-69 board.

- RG: Reset gate pulse
- CLP1 and CLP2: Clamp pulse
- XSHP and XSHD:

Sample and hold pulse for signal separation

#### · WEN:

Write enable. Trigger pulse during low-speed shutter (long-time exposure).

#### (2) CCD vertical transfer clock driver

IC1, IC3, and IC6 (CXD1250N) drive XV1 through XV4, XSG1, XSG2, and XSUB clocks for CCD vertical transfer block driving. The DXC-930/930P/960MD is a three-tube CCD camera, so it requires vertical transfer clock drivers for channels R, G, and B. Therefore, IC1 is used for channel G, IC3 for channel B, and IC6 for channel R.

### (3) CCD horizontal transfer clock driver (For channels R and B)

IC8 (MC74AC04MR) is a CCD horizontal transfer clock driver for channels R and B.

In the DXC-930/930P/960MD, a horizontal transfer clock in channel G is directly driven by TG IC because of its single channel. To drive channels R and B directly by TG IC, IC8 (MC74AC04MR) is mounted as a driver circuit because of its higher load. The H1 output signal of IC7 is thus inverted using IC8 to produce an H2 signal. Similarly, the H2 output signal of IC7 is inverted using IC8 to produce an H1 signal.

#### (4) 910 fH phase operation circuit

The 910 ftt phase operation circuit consists of IC4 (SN74HC 74ANS) and IC5 (SN74HC00ANS). This circuit is required to operate two TG IC circuits with phase difference of 180 degrees because the spatial offset technology described previously is used. IC5 has the corresponding function. Channel G must be delayed (180 degrees) in phase with respect to channels R and B. IC4 has the function in this case.

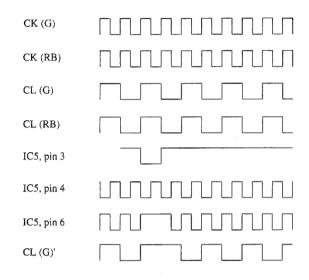
A 1820 fH ( $\rightleftharpoons$  28 MHz) clock with same phase is input to pins 64 (CK) of IC2 and IC7, and a 910 fH ( $\rightleftharpoons$  14 MHz) clock is output from pin 58 (CL). At that time, the CL clock in each channel is in-phase or opposite-phase. The CL clock is stabilized when it is in-phase or opposite-phase. As described previously, however, the CL clock in both channels must be opposite-phase. The CL clock must be forcibly set to the opposite phase by IC5 when it starts with in-phase during the power on sequence.

A CL (G) clock is input to pin 2 of IC5, and a CL (RB) clock is input to pin 1. The input clocks are then passed through a NAND gate. If the CL (G) and CL (RB) clocks are opposite-phase, the NAND gate output signal at pin 3 of IC5 is set high. If they are in-phase, a corresponding pulse is output. This pulse is input to pin 5 of IC5 and NANDed with the clock input to pin 4 of IC5. The output pulse at pin 6 of IC5 then becomes a dropout clock.

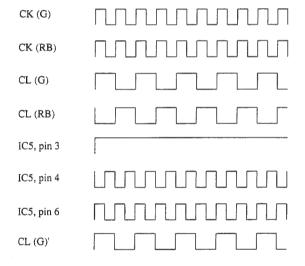
By using this pulse as a clock for channel G, the CL (G) phase is shifted 180 degrees with respect to the CL (RB) phase (opposite-phase). The output signal is set high even if the next CL (G) and CL (RB) clocks are NANDed. Therefore, dropout pulse KP is not output and stabilized in this state. The CL (G) phase must be also delayed with respect to the CL (RB) phase at all times. This operation is performed using IC4.

# **Timing Chart**

1 When CL (G) and CL (RB) clocks are in-phase



2 When CL (G) and CL (RB) clocks are opposite-phase



(5) LH1 negative power supply circuit

Pin 21 (VEE) of CXD1256AR is a -4 V power pin for LH1. Q4 and Q9 produce a -4 V power from the -9 V power and supply it to this pin.

(6) RGL bias adjustment circuit

The RGL bias adjustment circuit consisting of Q3, Q7, and Q8 adjusts the bias of a reset gate (RG) pulse. The RGL value varies depending on CCD imagers. This circuit thus adjusts the RG bias to the optimum value.

(7) Vsub voltage supply circuit

A circuit primarily consisting of Q1 and Q2, a circuit primarily consisting of Q5 and Q6, and a circuit primarily consisting of Q10 and Q11 supply a specified voltage to the overflow drains of CCD imagers for channels G, B, and R. The Q1 and Q2 pair, Q5 and Q6 pair, and Q10 and Q11 pair are regulators that use the Vsus control voltage as a reference voltage.

The Vsub control voltage can be changed in the range of approximately 1.6 to 5.0 V using RV1, RV3, and RV6. It is set so that the overflow drain of the CCD imager becomes a specified voltage. This voltage value varies depending on the CCD imagers. Adjustment is thus required.

In the shutter mode, the charge storage time can be controlled by adding a charge sweep pulse corresponding to the shutter speed to this DC bias. The period in which no charge sweep pulse is output in the shutter mode is defined as exposure time. The exposure time corresponds to the shutter speed. Therefore, this pulse is not output in the normal mode (shutter OFF).

#### 4-3. PR-158/158P BOARD

The PR-158/158P board consists of the circuits below.

- · Input amplifier
- Processing circuit (IC8: μPC2372)
- · Color-bar generator
- · Chroma signal generator
- · Y signal and aperture signal circuits

#### (1) Input amplifier

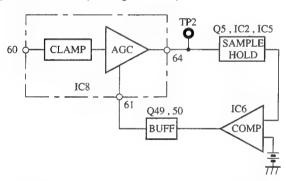
Since the circuit configuration in R, G, and B channels is almost the same, only the G channel is described below.

Trap filter FL2 eliminates a 14-MHz video signal component from channel B. The 300 mV voltage at TP7 is used as an input reference voltage.

An inverting amplifier consists of Q23, Q24, Q17, and Q18. The reference pulse from the AT board is mixed using Q18. Channels R and B select the gain during color temperature conversion by turning on or off Q8 and Q38. In the C TEMP mode of the camera, Q8 is turned on and Q38 is turned off when the color temperature is 3200 K. Q8 is turned off and Q38 is turned on when it is 5600 K. Q82 and Q83 clip it at 1 Vp-p when a high-luminance signal is input. The luminance level can be adjusted using an electronic volume control.

#### (2) Processing circuit

#### (1) GAIN: STEP (Fixed gain mode)



A negative video signal is input from pin 60 of IC8, clamped, then amplified in an AGC amplifier. The amplified signal (330 mV reference voltage at TP2) is input to a sample and hold circuit consisting of Q5, IC2, and IC5. The input signal processes the level of a reference pulse input during vertical blanking period as a DC value. The signal is then compared in IC6 and sent through buffers Q49 and Q50 to pin 61 of IC8. In this case, the gain (including a temperature characteristic) is made constant at all times.

In a gain of +18 dB for 0 dB, the reference pulse input from the AT board is input with the level reduced to 1/8. When the gain is set from 0 dB to +18 dB, the reference pulse decreases and the DC output increases in comparator IC6. The gain in IC8 then increases.

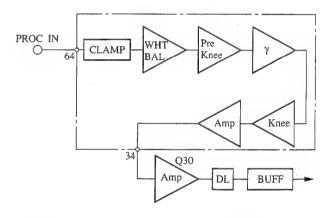
To track the gain in channel G, the values in channels R and B are compared with the hold value from pins 55 and 70 of IC8, with the sample and hold value of a G-channel reference pulse as reference. The comparison result is input to IC8. Limiters Q49 (pin 3) and Q50 (pin 1) determine the minimum and maximum gains.

#### ② GAIN: AGC

The signals output from TP2, TP3, and TP5 are passed through buffers Q19, Q4, and Q40 and mixed in Q25. The mixed signals are sent to clamping circuit Q28 and output to TP10. The output signal is then integrated in R65 and C44, compared in IC6, and input to IC8.

For the STEP (fixed gain mode) and AGC selection, the DC value of a reference pulse and the integrated value of an RGB mix signal are selected using IC3 and IC4.

# 3 Processing circuit

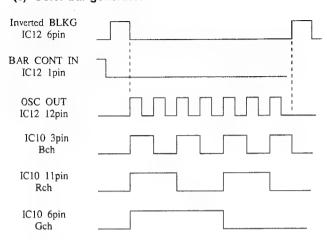


The circuit configuration in channel G is described below.

The signal that is input to IC8 again is clamped and passed through a WHT BAL amplifier. The signal is then passed through a pre knee circuit,  $\gamma$  circuit, and knee circuit and output from pin 34. The gain in this stage is approximately three times the normal. A signal of 1 Vp-p is output when a signal of 330 mVp-p is input. This gain is determined by changing the WHT BAL amplifier using an electronic volume control. A color-bar signal that is amplified in Q30 and output through a delay line to Q32 as a G OUT signal is mixed using Q30.



# (3) Color-bar generator



A BLKG pulse is input to pin 3 (4, 5) of IC12, inverted, and input to pin 2 of IC12. A monostable multivibrator is activated when a BAR CONT signal (at pin 1 of IC12) is low. An OSC OUT signal is then input to pin 11 of IC11, and a pulse shown in the figure above is output from IC10. A character signal is also input to IC10, and each signal in channels R, G, and B is mixed in Q13, Q30, and Q46.

#### (4) Chroma signal generator

A color-difference signal and Y signal are input from the R, G, and B OUT pins (TP6, TP9, and TP13) to IC8 via a matrix resistor (consisting of R136 through R154) and output from pins 22, 18, and 14.

An R-Y (I) signal is inverted in Q56, passed through a lowpass filter consisting of R190, L12, C85, and C86, and amplified in Q60. The amplified signal is input through clamping circuit Q61 to IC14 (subcarrier modulation IC). Similarly, a B-Y (Q) signal is input from Q64, amplified in Q68, and input through clamping circuit Q69 to IC14.

A BF signal is added to each signal, and the burst phase is determined by the signal level. A chroma signal generated in IC14 is passed through bandpass filter FL4 and amplified in Q54 and Q55. The amplified signal is output to pin 13 of connector CN2 and input to the IF board.

# (5) Y signal and aperture signal circuits

A Y signal generated in IC8 is output from pin 14 of IC8, amplified in Q77 and Q75, and input to pin 42 of IC17. The signal level is determined by the DC control (electronic volume control) at pin 30 of IC17. A DTL signal (input to pin 40 of IC17) and aperture signal in this Y signal are mixed. A Y OUT signal is then output from pin 22 of IC17, passed through three delay lines (100 m x 3) from Q84, and amplified in Q80. As a result, a signal of approximately 500 mVp-p is output from pin 15 of connector CN2 and input to the IF board. Delay lines DL6 through DL8 are used to align the phase of Y and chroma signals.

The R- and G-channel signals from Q12 and Q29 are mixed in Q70, passed through delay line DL5, and amplified in Q65. The amplified signals are input through buffer Q63 and clamping circuit Q74 to delay line DL4. The signal passed through delay line DL4 and the reflected signal are calculated to produce an aperture signal in IC17.

A DTL signal generated on the IF board is input from pin 1 of connector CN1. The input signal is sent to pin 8 of IC8, amplified in IC8, and output from pin 77 of IC8. The signal is then input through buffer Q52 to pin 40 of IC17 and mixed with a Y signal. DTL and aperture signals are mixed in Q53 to produce an RGB mix signal. The resultant signal is output to pin 17 of connector CN2.

#### (6) D/A converter

The data signal from the AT board is digital-to-analog converted in IC13, IC16, and IC18 to produce various control signals in IC8 and IC17.

#### 4-4. IF-354/354P BOARD

The IF-354/354P board primarily consists of the circuits below.

- · Detail signal circuit
- · Video signal driver circuit
- · Sync control circuit

#### (1) Detail signal circuit

The detail signal circuit generates H and V detail signals. It determines the mix ratio so that H: V is 1 to 1 using RV3. This circuit then sends the signals to the PR-158/158P board. For the H detail signal, G IE IN and R IE IN signals are adjusted and mixed using RV2 so that the moire in a detail signal is minimum. The resultant signal is differentiated two times using a two-stage filter to produce the H detail signal. For the V detail signal, a signal obtained when a G IE IN signal is 1H-delayed by CXI5504M is produced. The delay time of the signal is finely adjusted using a filter after it is amplified. The 1H-delayed signal is mixed with the inverted former G IE IN signal in Q14 to produce the V detail signal. RV1 is adjusted so that signals other than a detail component are eliminated using RV1.

#### (2) Video signal driver circuit

The detail signal returned from the PR-158/158P board is resistance-mixed with the R, G, and B OUT signals (1.0 V when 100%) from the PR-158/158P board. In channel G, the sync signal (adjusted to 300 mV (in 75-ohm termination) during output from the camera) whose level is adjusted using RV7 is mixed. The signal is then level-adjusted using RV4, RV5, and RV6 (adjusted to 1.4 V when 100%) and sent to the CN board by a driver circuit.

Y and C signals are sent through the driver circuit to the CN board, respectively. The Y and C signals passed through the driver circuit are resistance-mixed to produce a VBS signal and output through the driver circuit to the CN board.

# (3) Sync control circuit

The sync control circuit selects a sync signal by the SYNC CONT voltage from the CN board and outputs it by a driver circuit.

#### 4-5. AT-69 BOARD

#### <Outline>

The AT-69 board consists of the circuits below.

- · Auto white balance
- · Auto black balance
- · Auto iris
- · Electronic control
- · Character generator
- · Zoom and focus control
- Others

The AT-69 board performs various system controls such as an auto white balance, auto black balance, CCD iris, electronic shutter control, auto iris control, and AGL by using a microcomputer. This board reads the six switches on the rear panel and displays the state on the screen as a character to perform all the user controls. It also interfaces with the camera control unit (CCU) in series and controls the electronic control.

Eight-bit microcomputer IC20 (HD63B05Y0E53F: Hitachi) primarily performs the system controls above. The HD63B05Y0 is a CMOS eight-bit single chip microcomputer in which an 8K-byte ROM is masked. Fig. 1 shows the block diagram of the microcomputer.

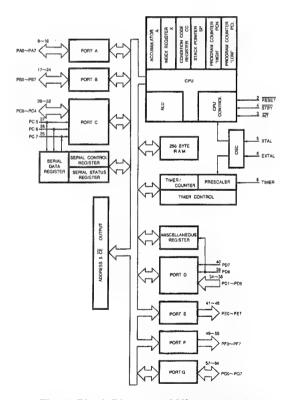


Fig. 1 Block Diagram of Microcomputer

The major features of this microcomputer are as follows:

- 256-byte RAM
- 32 I/O ports
- Seven input ports
- · Sixteen output ports
- Two internal timers
- Internal serial interface circuit
- Interrupts:

External port 2, timer 2, serial port 2, and software 1

• Minimum instruction time: 1 µsec

Table 1 shows the pin name and function of this microcomputer.

EEPROM IC21 (M6M80011AFP) is connected to this microcomputer. The auto white control data, auto black control data, internal control data, user control data displayed on the screen, and electronic control data are memorized in the EEPROM.

The M6M80011AFP is a 1024-bit CMOS EEPROM that enables an electric erasure and electric program. Fig. 2 shows the block diagram of the EEPROM.

The major features of the EEPROM are as follows:

- 5 V single power
- Clock sync serial input/output
- Three-port control (minimum) (Can connect CS and RESET, and D1 and D0.)
- Internal sequential controller
- Number of erasure and write times: 100000
- Data storage: 10 years

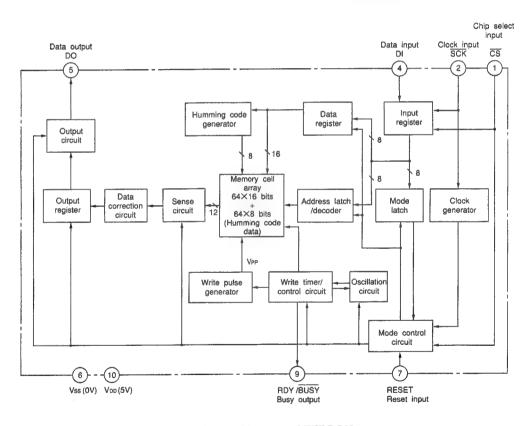


Fig. 2 Block Diagram of EEPROM

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	_	
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*	_	_
	_	
-		-
-		_

No.	PORT NAME	1/0	FUNCTION & REMARKS	
1	TIMER	I	TIMER INTERRUPT CLOCK IN (VD)	
2	PA7	0	D/A CONV. CS-5	
3	PA6	0	D/A CONV. CS-4	
4	PA5	0	D/A CONV. CS-3	
5	PA4	0	D/A CONV. CS-2	
6	PA3	0	D/A CONV. CS-1	
7	PA2	0	SHUTTER STROBE	
8	PA1	0	SERIAL DATA TO D/A, SHUTTER, CHARA GEN.	
9	PA0	0	SERIAL CLOCK TO D/A, SHUTTER, CHARA GEN.	
10	PB7	I	OPE/ADJ SELECT, SET=OPE	
11	PB6	I	NTSC/PAL SELECT, SET=PAL	
12	PB5	1	A/D CONV. IN	
13	PB4	О	CHARA STROBE	
14	PB3	0	CHARA CS	
15	PB2	I	EEPROM BUSY	
16	PB1	0	EEPROM CS	
17	PB0	I	EEPROM DATA IN	
18	PC7	0	LADDER R2	
19	PC6	0	LADDER R3	
20	PC5	0	LADDER R4	
21	PC4	0	LADDER R5	
22	PC3	0	LADDER R6	
23	PC2	0	LADDER R7	
24	PC1	0	LADDER R8	
25	PC0	0	LADDER R9	
26	Vcc	I	DC 5V IN	
27	PD1	I		
28	PD2	I	PRESET INPUT FOR ADJ	
29	PD3	I	0/18dB SELECT, CLR=0dB, SET=18dB	
30	PD4	I	18dB CONT INT/EXT, SET=INT, CLR=EXT	
31	PD5	I	GEN LOCK INT/EXT IN	
32	PD6	I	BLKG IN	
33	PD7	I	VD IN	
34	PE0	0	S/H CHARGE RESET SET=CHARGE RESET	
35	PE1	0	S/H TIME SELECT, SET=PEAK (WHT) S/H	

No.	PORT NAME	I/O	FUNCTION & REMARKS
36	PE2	0	S/H AREA SELECT I
37	PE3	0	S/H AREA SELECT 2
38	PE4	0	S/H AREA SELECT 3
39	PE5	0	S/H CHANNEL SELECT 1
40	PE6	0	S/H CHANNEL SELECT 2
41	PE7	0	S/H CHANNEL SELECT 3
42	PF0	0	A/D SELECT 1
43	PF1	0	A/D SELECT 2
44	PF2	0	CCU ID (ZOOM & FOCUS) SET=CCU MODE
45	PF3	О	IRIS CLOSE OUT CLR=IRIS CLOSE, SET=OPEN
46	PF4	О	CABLE COMP. FOR GEN LOCK, SET=ON, CLR=OFF
47	PF5	0	AGC/STEP GAIN SELECT, SET=AGC, CLR=STEP
48	PF6	0	
49	PF7	0	SERIAL DATA OUT TO CCU
50	PG7	0	
51	PG6	О	IRIS AUTO/MANU OUT, SET=MANU, CLR=AUTO
52	PG5	0	VBS Y/C SELECT, SET=VBS, CLR=Y/C
53	PG4	0	C. TEMP, SET=5600K, CLR=3200K
54	PG3	0	SC 0/180 CONT., SET=180, CLR=0
55	PG2	0	SYNC ON GREEN, SET=ON, CLR=OFF
56	PG1	0	BARS, SET=ON, CLR=OFF
57	PG0	0	FLD/FRM, SET=FRAME MODE, CLR=FIELD MODE
58	Vss	I	GND IN
59	RESET	I	SYSTEM RESET PORT
60	INT	I	SERIAL INTERRUPT
61	STBY	1	STANBY IN
62	XTAL	I	4MHz OSC
63	EXTAL	I	4MHz OSC
64	NUM	I	

Table 1 Pin Name and Function

# (1) Auto white balance circuit

The white balance is established by making the level of R and B signals the same as that of a G signal when a white object is shot.

The R, G, and B signals output from the PR-158/158P board are input to generate R-G and B-G signals. Assume that the peak value of a Y signal produced when the R, G, and B signals are mixed is a white level. The R-G and B-G signals are sampled at the peak of the Y signal to obtain an error signal in the white level. The error signal is A/D converted and input to the microcomputer as 8-bit data. The microcomputer calculates a gain control signal from this error signal and outputs it. The output signal is input to the D/A converter to control the R and B gains on the PR-158/158P board by an analog output signal. The white balance is then established.

Actually, the level of the peak value is checked before white balance operation to judge whether the input level is proper. The white balance operation is initiated after the input level is judged to be proper.

# 1 Operation of input value level check

The signal input to the base (G-channel) of Q3 is passed through buffer Q3 and clamped in Q5 using an HD pulse. The clamped signal is passed through buffer Q2, then sampled and held in IC9 using a Y peak signal. The Y signal from the PR-158/158P board is input to the base of Q12. The input signal is sent through buffer Q12 to clamping circuit Q14 and input to pin 3 of IC15 after a negative unwanted signal is sliced in NAM circuit Q13.

IC15 (2/3) cuts the superimposed reference pulse from the PR-158 board using a blanking signal. After that, the peak level is held in Q20 and D4, and a Y peak pulse is obtained in Q17. The Y peak pulse input to pin 15 of IC14 is GATEed in the detection frame shown in Fig. 3 and output from pin 3 of IC14. The pulse is then used as a sample and hold pulse of IC9. The detection frame is obtained by controlling an IC using a microcomputer. The G signal that is sampled and held using a Y peak signal is sent through analog switch IC5, IC7, and Q4 to pin 5 of IC11. The reference voltage (REF DC) (approximately 0.6 V) obtained at the emitter of Q15 is sent through IC5, IC7, and Q4 to pin 2 of IC11. IC5 is switched using a microcomputer. A G-REF DC signal is obtained at pin 10 of IC11, amplified in IC11, then input to pin 14 of IC13. Analog switch IC13 selects an A/D conversion input signal. The input signal at pin 14 of IC13 is input to pin 13 of IC11. The resultant signal is A/D converted using a sequential A/D converter consisting of comparator IC11 (4/4) and microcomputer IC20 so as to load data into the microcomputer. Limiters D3 and D2 limit the amplitude of a signal so that it does not change in the range exceeding 0 to 5 V.

The G-REF DC signal loaded into a microcomputer is compared with the data that is written in advance in EEPROM. The comparison becomes invalid when the output level is less than 40 IRE (PAL: 300 mV) . The white balance operation is initiated when the output level is more than 40 IRE (PAL: 300 mV) .

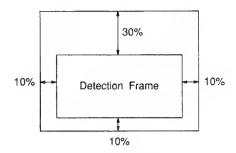


Fig. 3 White Peak Detection Frame

# ② White balance operation

As described in step 1, R, G, and B signals are simultaneously sampled and held in IC9. Error signals G–G, R–G, and B–G can be obtained at pin 10 of IC11 when IC5 and IC2 are switched using a microcomputer. The G–G signal is memorized in the microcomputer as a reference voltage. The R–G and B–G signals are also memorized in the microcomputer as an 8-bit digital signal. The G–G and R–G error voltages memorized in the microcomputer are compared. If the difference is within one bit (the least significant one bit of an 8-bit signal), the white balance is judged to be established. If the white balance is established, the microcomputer proceeds to the next step without correction. If not, that is,  $\Delta$  exceeds "1" ( $\Delta$  > 1) in the expression below, the R gain is changed and the gain of the R signal is adjusted to establish the white balance.

$$(G-G) - (R-G) = \Delta$$

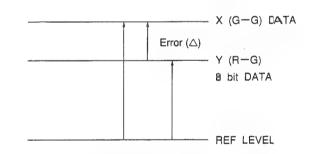


Fig. 4 Error Voltage

The R gain signal is serial data. It is sent from the microcomputer to D/A converter IC16 on the PR-158/158P board and converted into an analog voltage. The resultant signal is output to the gain control circuit. At that time, the microcomputer changes an 8-bit digital signal to 00H through FFH by the  $\Delta$  value.

However, the operation becomes invalid when the difference between the R-G and G-G signals is great and when the white balance is not established even if "00H" or "FFH" is output. The R gain signal is repeatedly changed until the difference between the R-G and G-G signals becomes within one bit. If the difference is within one bit, the operation is judged to be satisfactory. This operation is done three times again. When it is judged to be satisfactory four times in all, the four-times operation data is compared and arranged in the descending order. The mean value of the two data items in the middle is used as the final R gain data. The R and B gains are corrected by one sample-and-hold operation. Channel B is also controlled in the same manner as channel R (Fig. 5). After the white balance operation is completed, the R and B gain data are written in the EEPROM and messages "WHITE:OK" and "WHITE:NG" are output on the monitor. The auto white balance operation is then completed.

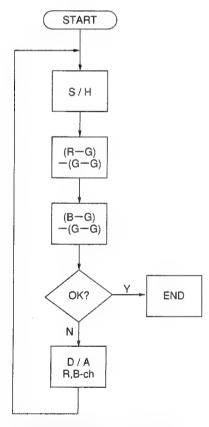


Fig. 5 White Balance Operation

#### (2) Auto black balance

The auto black balance operation is performed in the procedure below.

- The iris of a lens is closed forcibly. The light amount is detected to confirm that the iris is closed electrically.
- 2) The black tracking operation is performed to stabilize it so that the output black level (pedestal level) does not fluctuate when the gain select switch is set from 0 dB to 18 dB with the lens closed. The auto black tracking is performed using an R signal. Next, it is performed using a B signal, then G signal.
- 3) The black balance operation is performed. The black levels in all the channels of R, B, and G signals are made same. The black levels of G-G and R-G signals are compared with the lens closed. If an error occurs, the black level of the R signal is corrected. Next, the black levels of G-G and B-G signals are compared. If an error occurs, the black level of the B signal is corrected. As a result, the black level between channels is established.

The auto black operation is completed when the three operations above are completed.

#### ① Lens iris close operation

To establish auto black balance, the external light must be shut off. Therefore, the iris must be closed when establishing the black balance. Pin 45 of microcomputer IC20 is kept low if the black balance switch is set to ON when an auto iris lens is used. A high-level signal is then output from Q22 and sent to the lens as an iris close signal. Whether the lens iris is completely closed at that time is judged by the G-REF DC signal detection. The microcomputer selects so that IC5 obtains an R-REF DC signal. In this case, the absolute value of the G-REF DC signal is not detected to judge whether the lens iris is closed. By using an electronic shutter and judging from the relative value, precise detection can be done not depending on a change in temperature and a change with the passage of time. As shown in Fig. 6, the shutter speed is first set to 1/60 (sec) to detect a G-REF DC signal, then 1/1000 (sec) for detection. If no change appears in the detection value, the lens iris can be closed.

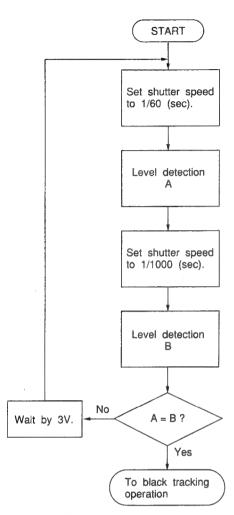


Fig. 6 Iris Close Check

# ② Black tracking operation

During black tracking operation, the pedestal levels of R, G, and B signals are stabilized so that they do not fluctuate when the gain select switch is set from 0 to 18 dB and vice versa with the iris closed. IC20 is switched by a microcomputer after confirming that the iris is closed. An R-REF DC signal, G-REF DC signal, and B-REF DC signal can be then obtained sequentially. Data is first A/D converted with the gain set to 0 dB. The A/D converted data is memorized in the microcomputer. Next, the gain is set to 18 dB. The data is then memorized.

A black tracking control signal is produced by the difference of the data when the gain select switch is set to 0 dB and 18 dB. The signal is then sent to D/A converter IC12 by serial data to produce an analog output signal. The resultant signal is mixed with a black tracking preset voltage when it is input to IC10. A blacking tracking pulse is then obtained from IC10 using an HD pulse. The pulse is amplified in IC8 and sent to the PR-158/158P board. This operation is repeatedly performed when the gain select switch is set from 0 to 18 dB and vice versa. The difference of the data is controlled so that it is within 11 bits.

## 3 Black balance operation

During black balance operation, the black level of a G signal is sequentially compared with the black levels of R and B signals with the iris closed. G–R and G–B signals are then obtained. R and B pedestal signals are output to the PR-158/158P board to adjust the pedestal levels of the R, G, and B signals so that the difference between the G–R and G–B signals is zero ("0"). A reference pulse is first produced by a G–G signal, and an R–G signal is A/D converted. The difference between the G–G and R–G signals is D/A converted to produce an R pedestal signal and output to the PR-158/158P board. A B–G signal is also treated in the same manner as the above. These operations are the same as the white balance operation except that the iris is closed or opened.

# (3) Alarm displays

During auto white balance and auto black balance operations, the alarm displays below are output on the monitor.

Display	Description	
WHITE : OK	Indicates that the white balance was established.	
WHITE : NG	Displayed when the white balance is not established for a fixed time period. The circuit, lighting condition, or adjustment is defective.	
WHITE : NG LEVEL : LOW	Displayed when the video output level is too low (less than about $40~\text{IRE}~(\text{PAL}:300~\text{mV})$ ).	
WHITE : NG LEVEL : ???	Displayed when the video output level does not change at a during white balance operation.	
WHITE : NG C. TEMP : HI	Displayed when the color temperature is too high. Change the lighting condition or color temperature.	
WHITE : NG C. TEMP : LOW	Displayed when the color temperature is too low. Change the light ing condition or color temperature.	
BLACK : OK	Indicates that the black balance was established.	
BLACK : NG	Displayed when the black balance is not established. The circuit of adjustment is defective.	
BLACK : NG IRIS : CLOSE?	Displayed when light goes in the lens.	

**Table 2 Alarm Displays** 

(4) Character generator

IC22 ( $\mu$ PD6142G) generates a character on the monitor. The data for the display is input from a microcomputer. Each alarm, user control status, adjustment data are displayed. Fig. 7 shows the block diagram of the character generator.

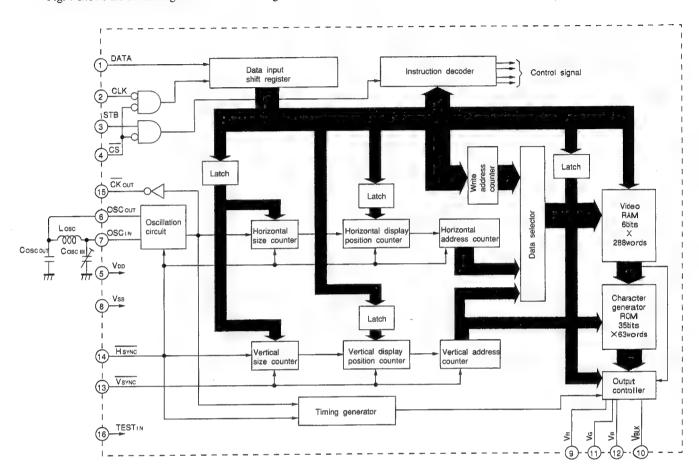


Fig. 7 Block Diagram of Character Generator

# (5) Electronic control and adjustment

Electronic control are used instead of semi-fixed controls for the adjustment and user control. ADJ NO. and DATA are displayed when switch SW1 is set to "ADJ". During adjustment, an analog voltage is output to D/A converters IC12 and IC23, and data is simultaneously written in EEPROM IC21.

Table 3 shows the electronic control list.

Adjust NO.	Data Name	Remarks	D/A OUT	BOARD
1	R. Black Tracking		IC12 19 pin	AT-69
2	G. Black Tracking		IC12 ②	AT-69
3	B. Black Tracking		IC12 ③	AT-69
4		Not using		
5	Y Level		IC13 18	PR-158/P
6	Sync Level		IC13 19	PR-158/P
7	Set Up Level		IC13 ②	PR-158/P
8	Enable White.Clip		IC13	PR-158/P
9	AGC Max Level		IC13 ④	PR-158/P
10	AGC Min Level		IC13 ⑤	PR-158/P
11	*AGC / Step	AGC Refference Level Setting	IC13 ⑥	PR-158/P
12	*Step / AGC	Step Refference Level Setting	IC13	PR-158/P
13	Master WHT. Bal		IC16	PR-158/P
14	R WHT. Bal		IC16 ②	PR-158/P
15	B WHT. Bal		IC16 ③	PR-158/P
16	R. Pre Knee		IC16 ⑥	PR-158/P
17	G. Pre Knee		C16	PR-158/P
18	B. Pre Knee		IC16 ®	PR-158/P
19	R. Pedestal		IC16 9	PR-158/P

Adjust NO.	Data Name	Remarks	D/A OUT	BOARD
20	G. Pedestal		IC16	PR-158/P
21	B. Pedestal		IC16	PR-158/P
22	Gamma		IC18	PR-158/P
23	Knee		IC18 ④	PR-158/P
24	White. Clip		IC18	PR-158/P
25	Aparture Level		IC18 ⑥	PR-158/P
26	Aparture Crisp.		IC18	PR-158/P
27	DTL-MAX		IC18 (8)	PR-158/P
28	DTL Level		IC18 9	PR-158/P
29	DTL Crisp.		IC18	PR-158/P
30	Iris Refference		IC23	AT-69
31	SC. Phase		IC23 ⑤	AT-69
32	CCD-Iris Level		*	AT-69 (IC20)
33	Spare EVR for AT	Not using		
34	R AGC clip	Rch clip level at AGC input	IC13	PR-158/P
35	B AGC clip	Bch clip level at AGC input	IC13	PR-158/P
36				
37	Peak min.	White balance min. data	*	AT-69 (IC20)
38	Iris close	Iris close margin data	*	AT-69 (IC20)

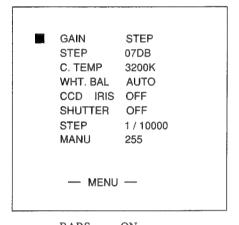
\*: Constant in IC20 / AT-69

Table 3 Electronic control list

#### (6) User control

As shown in Fig. 8, the user control state such as a gain control, detail control, and shutter control is displayed on the monitor to control data using six switches on the rear panel. Voltage values are set to the six switches, respectively. These voltage values are A/D converted, then read by a microcomputer.

The input voltage at pin 2 of IC13 is passed through IC13 and A/D converted by IC11 and the microcomputer to judge which switch was pressed.



**BARS** ON M. PED +12 DTL -22H. PHASE 128 SC 140 0/180 180 **GAMMA** ON G. SYNC ON FLD/FRM FLD D-SUB **VBS** 

Fig. 8 User Control

# (7) Gain control circuit

The gain control is primarily performed on the PR-158/158P board. A reference pulse used for the gain control is controlled in this circuit. The reference pulse is shown in Fig. 9. The size of the reference pulse is controlled in an automatic gain control (AGC) and fixed gain by the microcomputer. The voltage at pin 12 of D/A converter IC12 is switched to 5 V in IC3 to produce a pulse. The pulse is then output from the emitter of Q1 to the PR-158/158P board. The switching pulse in IC3 is produced by ANDing HD and CLP1 pulses in IC19 (TC4S81f).

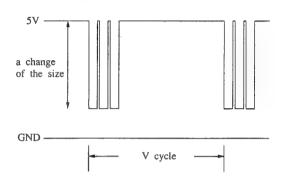


Fig. 9 Referense Pulse

#### (8) CCD iris

The CCD iris keeps the video output level constant by changing the shutter speed of the CCD.

The Y signal from the PR-158/158P board is input to the base of Q12. The input signal is clamped in Q14, and the unwanted portion is sliced in NAM circuit Q13. The resultant signal is input to pin 1 of IC15 (1/3), where a reference pulse is cut. The signal is then passed through buffers Q24 and Q25 and rectified in R88 and C27. A Y REF DC signal is produced by switching IC5. The Y REF DC signal is A/D converted, and data is loaded into the microcomputer.

This data is compared with the data that is memorized in advance in the EEPROM. The shutter speed is calculated so that the difference is zero ("0"). The calculated result is sent to the shutter speed control circuit on the TG-102/102P board by serial data. The video output level is controlled so that it is always constant.

#### (9) Auto iris

The Y signal input to the base of Q12 is sent to clamping circuit Q14. The unwanted portion is eliminated in NAM circuit Q13. A reference pulse is cut in IC15 (1/3). The resultant signal is input through buffer Q24 to pin 5 of IC1 (1/4). The input signal is buffered in IC1 (1/4), rectified in R8 and C5, then input to pin 2 of IC1 (2/4). In IC1 (2/4), the voltage output from pin 4 of D/A converter IC23 is input to pin 3. IC1 (2/4) also forms a loop so that the rectified value input to pin 2 is constant.

#### (10) Zoom and focus circuits

The zoom and focus can be controlled when a remote control unit (RM-930) and camera control unit (CCU) are connected.

#### ① When remote control unit is connected

A ZOOM control voltage is input from the remote control unit to pin 2 of switch SW2. When SW2 is set to "ZF", the ZOOM control voltage is input to pin 2 of IC16 (1/3). Pin 10 of IC16 (1/3) is low when the remote control unit is connected. Therefore, the ZOOM control voltage is input to pin 3 of IC24 (1/2), amplified, then output from pin 1. The voltage changes in the range of 2 to 8 V. A FOCUS control voltage is also the same as the ZOOM control voltage.

② When camera control unit (CCU) is connected Pin 10 of IC16 (1/3) is set high when the CCU is connected. The ZOOM control voltage sent from the CCU by serial data is sent to D/A converter IC23 and output from pin 6. The output signal is then input through IC16 to pin 3 of IC24 (1/2). The ZOOM control voltage from pin 1 changes in the range of approximately 2 to 8 V. A FOCUS control voltage is also the same as the ZOOM control voltage.

When switch SW2 is set to "PT" during CCU connection, the PAN and TILT control voltages from the CCU are output from pins 8 and 9 of IC23 and sent through SW2 to pins 21 and 19 of connector CN2.



#### 4-6. SG-194/194P BOARD

#### <OUTLINE>

The SG-194/194P board generates various sync signals. This board automatically sets the external sync mode when a genlock (VBS) signal is input from the outside, then outputs a sync signal synchronized with the genlock signal.

#### Internal sync

For the NTSC system, the DC clock controlled by RV1 is sent through IC6 (CXD1216M) to buffer Q5 to control VCO CP1 and set a clock frequency. The 28 MHz clock is sent to the TG-102/102P board, frequency-divided by one half, then sent back. The clock is then input to pin 26 of IC10 (CXD1217M). Various pulses are then output with this clock as reference.

For the PAL system, the DC clock controlled by RV1 controls CP2. A 4 fsc signal is input to pin 10 of IC10. This signal is sent to phase comparator IC10 and output from pin 24 (H COM OUT). The output signal is then sent through IC6 to a low-pass filter (consisting of R37, R41, C22, and C24) and buffer Q5 to control VCO CP1.

#### External sync (VBS genlock)

An EXT VBS signal is input from pins 4 and 2 of connector CN1. The EXT VBS signal is input from pin 4 of CN1 when it is input the camera. The EXT VBS signal is input from pin 2 of CN1 when it is input to the camera control unit (CCU). The camera side has priority in this case. The VBS signal input to pin 4 of connector CN1 is input to pin 5 of IC1 (1/2) and amplified in IC1 (1/2). After that, the lower edge of a sync signal in the VBS signal is clamped to ground using C4 and D3. When the VBS signal is input to hold the DC component at the upper edge of a sync signal using C9, pin 11 of IC2 (2/3) is set low. The VBS signal is then supplied to the sync separation circuit.

The VBS signal input to pin 2 of connector CN1 is terminated in R4 and sent to pin 1 of IC1 (1/3). Pin 10 of IC2 (1/3) is set high when the extension distance of the camera and CCU is 200 m or 300 m. A cable compensation circuit consisting of C12, R14, C11, R13, C10, and R12 is then activated.

Q2 and Q1 is a floating amplifier that cancels the hum occurring during cable extension. The VBS signal is then sent through buffer Q3 to the sync separation circuit. The burst component in the VBS signal is passed through bandpass filter consisting of L3 and C15, amplified in Q4, and converted into an amplitude of 0 to 5 V using comparator IC5. R25 slightly contains hysteresis to prevent noise. The burst component output from pin 6 of IC5 is input to pin 17 of IC6. The burst component is compared with an internal subcarrier in IC6. The comparison output is sent to pin 1 of IC6 to pin 2 of IC7, where the VD period is extracted (because the V BLKG period of the burst component is lost, nothing to be compared exists, and an error occurs in the output of the comparator). The resultant signal is passed through a low-pass filter consisting of R35, R36, C20, and C21, amplified in operational amplifier IC8 (1/2), then input to the control voltage input pin of CP2 (4 fsc VCO), where an oscillated 4 fsc signal is input to sync signal generator IC10. As a result, an internal subcarrier is locked to the external subcarrier (burst). The subcarrier generated in IC10 is sent to the encoder using an SC phase shifter consisting of IC12 and IC13. The subcarrier from IC10 is input to pin 9 of IC13 (2/2) and output from pin 12 with the pulse width

changed. This pulse width can be changed by the external DC control. In this case, a feedback is established by IC12 to compensate for the temperature characteristic. The output signal is input to pin 2 of IC13, then output with the duty cycle set to 50 %. The  $0/\pi$  selection can be performed by selecting Q and Q output signals using analog switch IC3 (1/3). The subcarrier phase can be continuously changed by changing the pulse width above. The phase of the encoder output subcarrier then coincides with that of the external subcarrier.

The sync signal in the VBS signal is amplified in Q10 through Q12 and sent through a low-pass filter consisting of R94 and C63 to sync separation circuit IC4. The sync signal is then input to pin 17 of IC6. The FH pulse output from pin 27 of IC10 is input to monostable multivibrator IC11 (1/2). The pulse width can be then changed by the external DC control. In this case, a feedback is established by IC8 (2/2) to compensate for the temperature characteristic. The pulse is then input to pin 15 of IC6 and compared with the external sync signal above. An output signal at pin 9 is passed through a low-pass filter consisting of R37, R41, C22, and C24 to control CP1 (VCO). As a result, the phases of an internal H pulse and external sync signal are kept constant. These phases can coincide with each other by control-ling the pulse width of H phase shifter IC11 (1/2).

#### • Generation of CLP5

A CLP5 pulse is used to clamp the AGC circuit on the PR-158/158P board. It has the phase relation shown in Fig. 1. An HD pulse at pin 8 of IC10 is integrated in R84 and C56, then input to IC14. The input pulse is inverted in IC14 and integrated in R85 and C57. The pulse width is controlled by monostable multivibrator IC11 (2/2). The resultant pulse is output from pin 6.

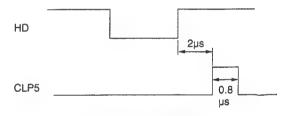
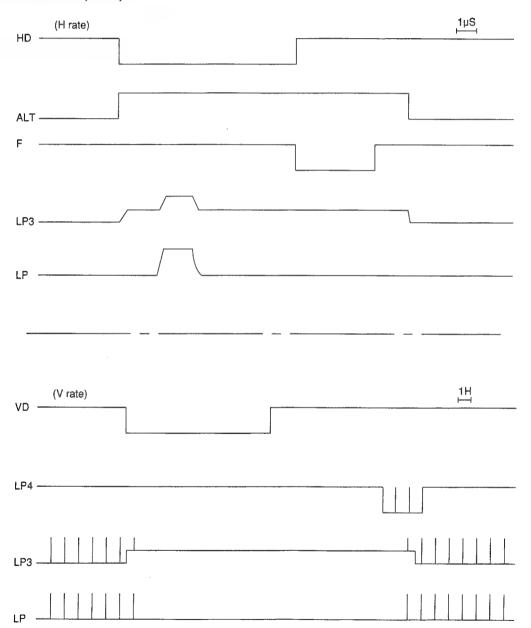


Fig. 1 CLP5 (NTSC)

The MB-380 board primarily consists of a DC/DC converter that supplies the DC power required for each block and a circuit that generates seven pulses from a pulse on the SG board and sends them to the PR-158/158P board. Fig. 1 shows the timing chart for each output pulse. C9, R3, R4, R5, and R6 are a noise elimination filter when operating the lens using RM-930.

# Timing Chart of DXC-930 (NTSC)





# 4-8. CN-579/580 BOARD

The CN-579/580 board consists of an input and output connectors, control voltage circuit, and video signal driver circuit. The CN-579 board differs from the CN-580 board in that it has the number of pins required for connection with CCU-M3, CCU-M7, and RM-930.

The VBS signal of a 9-pin DSUB connector (CN5) and the Y/C signal output are selected using an analog switch. A sync signal is selected using switch SW7.

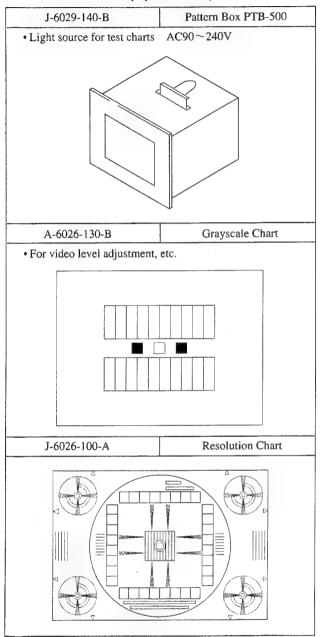
The SENSE (+) and (-) pins on the CN-579 board output a reference DC voltage (approximately 2.5 when a proper voltage is supplied to the camera) to fix the supply voltage sent from CCU to DXC-930 when they are connected to the CCU.

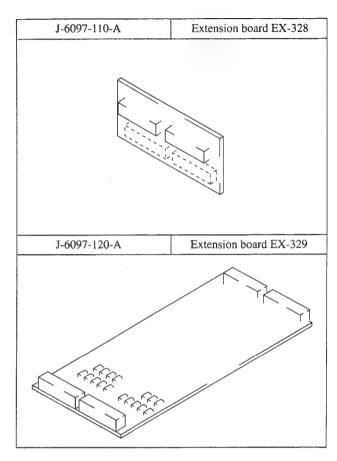


# SECTION 5 ALIGNMENT

# 5-1. PREPARATION

# 5-1-1. Fixtures and Equipments Required

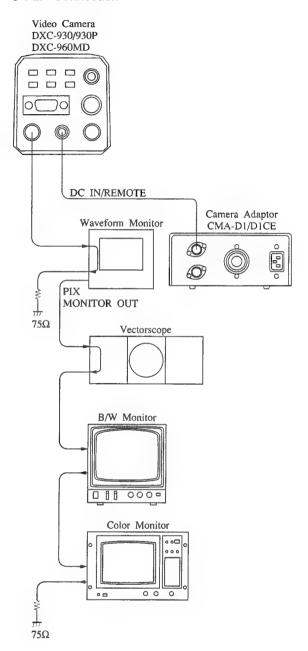




# Commercial equipment and fixture

- Dual Trace Oscilloscope
- Vectorscope
- · Waveform Monitor
- Frequency Counter
- Digital Voltmeter
- B/W Monitor
- Color Monitor
- · Bayonet type lens with manual iris function
  - 1/2-inch lens
  - 2/3-inch lens + LO-32BMT lens mount adaptor

#### 5-1-2. Connection



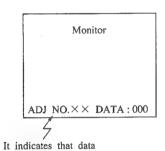
# 5-1-3. How to adjust an electronic control

The DXC-930/DXC-930P/DXC-960MD/XC-009/XC-009P has the electronic controls in addition to the controls that are mounted on the each board for adjustment.

How to adjust an electronic control is shown below.

 Adjustment mode for an electronic control Set the SW1/AT-69 board to ADJ position, and the adjustment mode for an electronic control is put. The address and the data of an electronic control are displayed on the monitor screen.

This message means that the address is "ADJ NO. XX" and the data is "000".

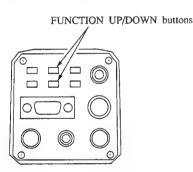


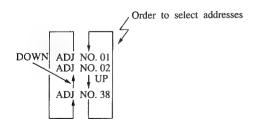
at address XX is 000.

# 2. Address Selection

The address that is displayed on the monitor will go up (or down) by pressing the FUNCTION UP (or DOWN) button on the rear panel. When pressing the FUNCTION UP (or DOWN) button continuously, displayed address will change in succession.

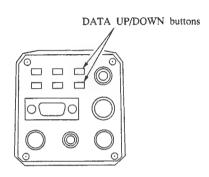
Order of address selection

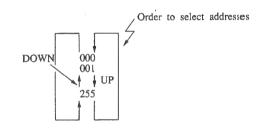




3. Data Selection (Electronic control adjustment) The data (adjustment value) that is displayed on the monitor will go up (or down) by pressing the DATA UP (or DOWN) button on the rear panel. By this operation, the adjustment value will change in the same manner that when an ordinary level control is turned.

Order of data selection





# 5-1-4. Switch Setting Before Adjustment

Menu Screen:

GAIN: STEP STEP 0 dB

C. STEP: 3200K WHT. BAL: MANU

R. GAIN +00

B. GAIN +00

CCD IRIS: OFF

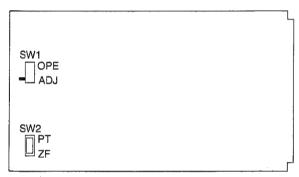
SHUTTER: OFF

AT-69 board:

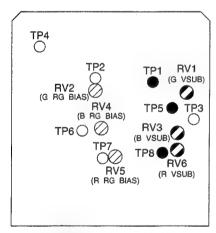
SW1 (ADJ/OPE): ADJ

Note: After the adjustment, set the SW1 (ADJ/OPE) /AT-69

board to OPE position.



AT-69 BOARD (B SIDE)



TG-102/102P BOARD (A SIDE)

#### 5-2. ADJUSTMENT

#### 5-2-1. G/R/B V Substrate Voltage Adjustment

**Note:** Before replacing any controls on TG-102/102P board or TG-102/102P board itself, be sure to measure voltage at following test points in advance.

After replacement is completed, adjust voltage at each test point for the measured value.

If the voltage can not be adjusted to the measured value, adjust for following specifications.

**Equipment:** Digital voltmeter

# Preparation:

 Disconnect the PR-158/158P, IF-354/354P and AT-69 board from the camera unit.

#### **Adjustment Procedure:**

• Perform adjustment in order of G, R and B channels as shown below.

**Note:** Before replacing any controls on TG-102/102P board or TG-102/102P board itself, be sure to measure voltage at following test points in advance.

After replacement is completed, adjust voltage at each test point for the measured value.

If the voltage can not be adjusted to the measured value, adjust for following specifications.

#### TG-102/102P board

	Test point (GND: TP3)	Adjusting point	Specification
G-ch	TP1	ØRV1	
R-ch	TP8	ØRV6	12.0±0.1 V dc
B-ch	TP5	<b>⊘</b> RV3	

**Note:** After the adjustment, return the PR-158/158P, IF-354/354P and AT-69 board to their normal position.

# 5-2-2. G/R/B PGL Voltage Adjustment

**Note:** Before replacing any controls on TG-102/102P board or TG-102/102P board itself, be sure to measure voltage at following test points in advance.

After replacement is completed, adjust voltage at each test point for the measured value.

If the voltage can not be adjusted to the measured value, adjust for following specifications.

#### Equipment: Digital voltmeter

#### Preparation:

• Disconnect the PR-158/158P, IF-354/354P and AT-69 board from the camera unit.

#### **Adjustment Procedure:**

• Perform adjustment in order of G, R and B channels as shown below

**Note:** Before replacing any controls on TG-102/102P board or TG-102/102P board itself, be sure to measure voltage at following test points in advance.

After replacement is completed, adjust voltage at each test point for the measured value.

If the voltage can not be adjusted to the measured value, adjust for following specifications.

# TG-102/102P board

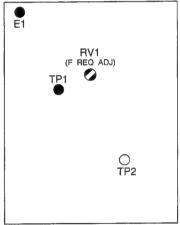
	Test point (GND: TP4)	Adjusting point	Specification
G-ch	TP2	ØRV2	
R-ch	TP7	ØRV5	2.0±0.1 V dc
B-ch	TP6	<b>⊘</b> RV4	

**Note:** After the adjustment, return the PR-158/158P, IF-354/354P and AT-69 board to their normal position.

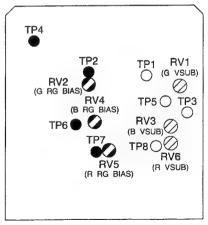
#### 5-2-3. Subcarrier Frequency Adjustment

**Equipment:** Frequency counter **To be extended:** SG-194/194P board

**Test point:** TP1 (GND: E1) /SG-194 (194P) board



SG-194 /194P BOARD (B SIDE)



TG-102/102P BOARD (A SIDE)

# 5-2-4. Color Bars Adjustment

**Equipment:** Oscilloscope, Waveform monitor

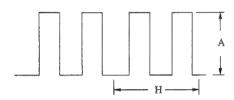
To be extended: PR-158/158P board

Preparation:

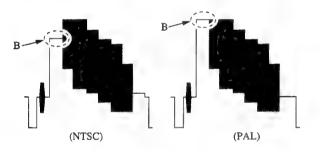
DISPLAY/BARS button → "BARS"

# **Adjustment Procedure:**

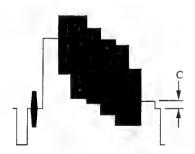
Adjust ◆RV14/PR board so that the video level "A" at TP9 (GND: E1) on the PR board is 750 ± 10 mV p-p (PAL; 1.0 ± 0.01 V p-p).



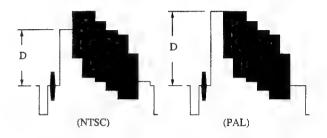
 Adjust ORV15 and ORV13/PR board so that the carrier leakage "B" at the gray level portion (PAL; white level portion) of VIDEO OUT waveform is minimum.



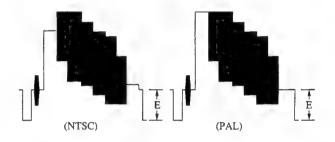
 (UC model only) Adjust "ADJ NO. 7" of the electronic control so that the set up level "C" at VIDEO OUT is 7.5 ± 1 IRF.



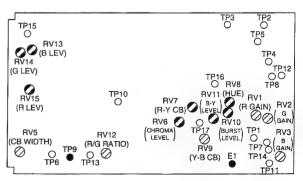
4. Adjust "ADJ NO. 5" of the electronic control so that the gray level "D" (PAL; white level "D") at VIDEO OUT is  $75 \pm 2$  IRE (PAL;  $700 \pm 10$  mV).



5. Adjust "ADJ NO. 6" of the electronic control so that the SYNC level "E" at VIDEO OUT is  $40 \pm 2$  IRE (300  $\pm$  10 mV).



Repeat steps 2 to 5 several times until the specification are met.



PR-158/158P BOARD (B SIDE)

# 5-2-5. Carrier Balance Adjustment

Equipment: Vectorscope (MAX GAIN)

To be extended: PR-158/158P board

Preparation:

• DISPLAY/BARS button → "BARS"

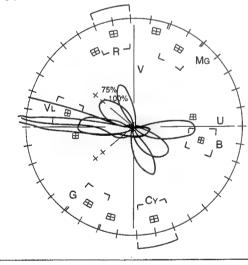
Test point: VIDEO OUT connector /rear panel Adj. point: ○RV7, ○RV9/PR-158 (158P) board

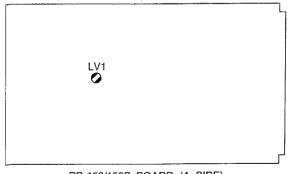
Specification:

Adjust RV7 and RV9/PR board so that the beam spot of the white level is located in the center of the vectorscope screen.

# [NTSC]

[PAL] (VECTOR NTSC button: ON)





PR-158/158P BOARD (A SIDE)

#### 5-2-6. Color Vector Adjustment

**Equipment:** Vectorscope **To be extended:** PR-158/158P board

Preparation:

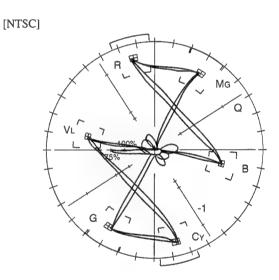
1. GAIN switch/vectorscope → 75% CAL

- 2. Adjust the PHASE control so that the beam spot of the burst is set to the 75% axis.
- 3. DISPLAY/BARS button → BARS

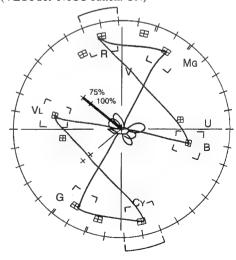
Test point: VIDEO OUT connector/rear panel

## **Adjustment Procedure:**

- Adjust ◆RV10/PR board so that the burst spot is located at 75% scale mark on the vectorscope screen.
- Adjust ORV6, ORV8, ORV11 and OLV1/PR board so that all the chroma spots are located on the specified scale point on the vectorscope screen.
- Repeat steps 1 and 2 alternately until the specification are met.



[PAL] (VECTOR NTSC button: ON)



## 5-2-7. Color-Bar Width Adjustment

**Equipment:** Oscilloscope **To be extended:** PR-158/158P board

Preparation:

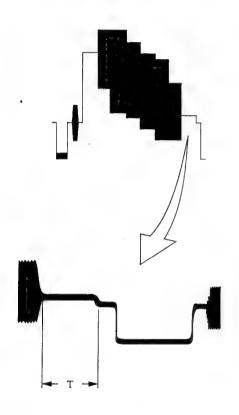
• DISPLAY/BARS button → "BARS"

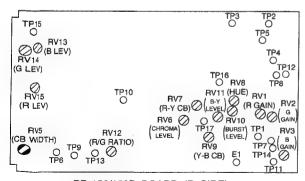
Test point:

VIDEO OUT connector/rear panel

Adj. point: Specification: **O**RV5/PR-158 (158P) board  $T = 4.0 \pm 0.2 \mu s$  (NTSC)

 $T = 5.3 \pm 0.2 \,\mu s$  (PAL)





PR-158/158P BOARD (B SIDE)

# 5-2-8. Video Level Adjustment

Subject:

Overall white, Grayscale chart

Equipment:

Oscilloscope

To be extended: PR-158/158P board

**Adjustment Procedure:** 

1. Subject: Overall white

Lens iris → Open

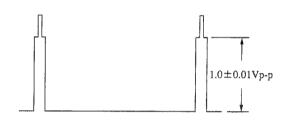
 C. TEMP. (Menu on the monitor screen) → 5600 K FLD/FRM (Menu on the monitor screen) → FLD

3. Adjust Electronic control as shown below.

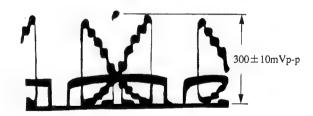
Test point /PR-158 board	Adjusting point/ electronic control	Specification
TP4 (GND: E1)	"ADJ No. 34"	1.0±0.01 V p-p

- 4. C. TEMP. (Menu on the monitor screen)  $\rightarrow$  3200 K
- 5. Adjust Electronic control as shown below.

Test point /PR-158 board	Adjusting point/ electronic control	Specification
TP12 (GND: E1)	"ADJ No. 35"	1.0±0.01 V p-p



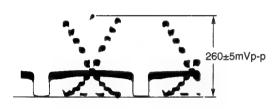
- 6. Subject: Grayscale chart
- Adjust the lens iris so that the video level at TP7 (GND: E1) on the PR board is 300 ± 10 mV p-p.



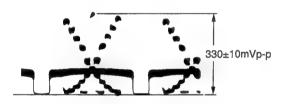
- 8 Set the data of "ADJ No. 10" (Electronic control) to 50.
- 9. Set the data of "ADJ No. 12" (Electronic control) to 100.

10. Perform adjustment in order of G, R and B channels as shown below.

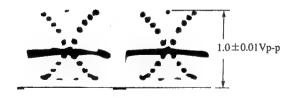
	Test point /PR-158 board	Adjusting point /PR-158 board	Specification
G	TP2 (GND; E1)	⊘RV2	
R	TP3 (GND: E1)	<b>⊘</b> RV1	260±5m V p-p
В	TP5 (GND: E1)	<b>⊘</b> RV3	



11. Adjust the "ADJ NO. 12" of the electronic control so that the video level at TP2 (GND: E1) on the PR board is  $330 \pm 10$  mVp-p.

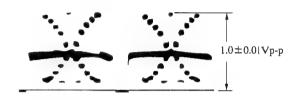


- 12. Adjust electronic control "ADJ No. 10" so that the value is raised, and stop it just before the video level goes up.
- 13. Adjust the "ADJ NO. 13" of the electronic control so that the video level at TP9 (GND: E1) on the PR board is  $1.0 \pm 0.01$  Vp-p.

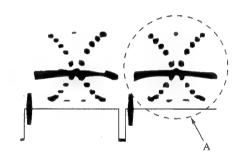


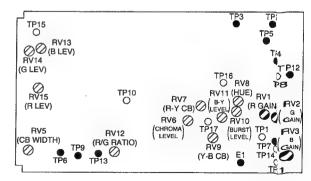
 Perform adjustment in order of R and B channels as shown below.

	Test point /PR-158 board	Adjusting point/ electronic control	Specification
R	TP6 (GND: E1)	"ADJ No. 14"	10,0017/
В	TP13 (GND: E1)	"ADJ No. 15"	1.0±0.01 V p-p



 Repeat steps 13 and 14 alternately until a portion A of the carrier leakage at VIDEO OUT is minimum on the waveform monitor screen.





PR-158/158P BOARD (B SIDE)

# 5-2-9. Black Set Adjustment

Equipment:

Waveform monitor, Vectorscope

To be extended: PR-158/158P board

Preparation:

Lens iris → Close

#### **Adjustment Procedure:**

 Adjust "ADJ NO. 20" of the electronic control so that the video level "A" at VIDEO OUT is 10.5 ± 2 IRE (PAL; 3 ± 1 %).



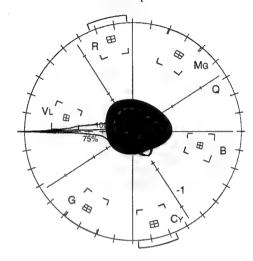
Adjust "ADJ NO. 19" and "ADJ NO. 21" of the electronic control alternately so that the carrier leakage at VIDEO OUT is minimum.



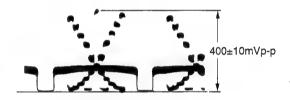
- Repeat steps 1 and 2 alternately until the specifications are met.
- 4. GAIN switch → 18 dB
- 5. Adjust "ADJ NO. 2" of the electronic control so that the video level "B" at VIDEO OUT is  $10.5 \pm 2$  IRE (PAL;  $3 \pm 1$ %).



6. Adjust "ADJ NO. 1" and "ADJ NO. 3" of the electronic control alternately so that the beam spot of black level is located in center on vectorscope screen.



- Repeat steps 5 and 6 alternately until the specifications are met.
- 8. Adjust the lens iris so that the video level at TP2 (GND: E1) /PR board is  $400 \pm 10$  mVp-p.



9. Adjust "ADJ NO. 9" of the electronic control so that the video level "C" at TP2 (GND: E1) /PR board is set just before the level goes down.



**Note:** After the adjustment, set the switch as shown below. GAIN switch  $\rightarrow$  0dB

# 5-2-10. GAIN AGC Adjustment

Subject:

Grayscale chart

Equipment:

Oscilloscope

To be extended: PR-158/158P board

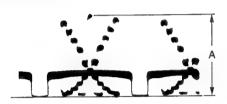
Preparation:

• Lens iris → F8

• GAIN (Menu on the monitor screen)  $\rightarrow$  AGC

**Adjustment Procedure:** 

• Adjust "ADJ NO. 11" of the electronic control so that the video level "A" at TP2 (GND: E1)/PR board is  $300 \pm 5$  mV p-p.



**Note:** After the adjustment, set the switch as follows. GAIN (Menu on the monitor screen)  $\rightarrow$  STEP

#### 5-2-11. Cross point Adjustment

Subject:

Grayscale chart

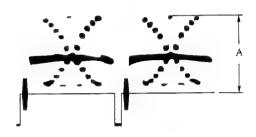
Equipment:

Waveform monitor

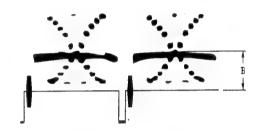
To be extended: PR-158/158P board

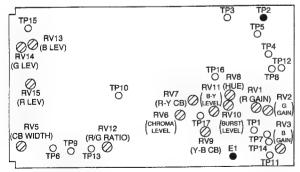
**Adjustment Procedure:** 

 Adjust the lens iris so that the video level "A" at VIDEO OUT is 100 ± 2 IRE (PAL; 700 ± 10 mV).



2. Adjust "ADJ NO. 22" of the electronic control so that the cross point level "B" at VIDEO OUT is  $56 \pm 1$  IRE (PAL;  $360 \pm 5$  mV).





PR-158/158P BOARD (B SIDE)

# 5-2-12. White Level Adjustment

Subject:

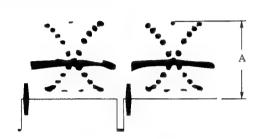
Grayscale chart

**Equipment:** 

Waveform monitor To be extended: PR-158/158P board

**Adjustment Procedure:** 

1. Adjust the lens iris so that the video level "A" at VIDEO OUT is  $100 \pm 2$  IRE (PAL;  $700 \pm 10$  mV).



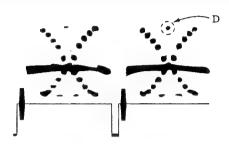
2. Adjust "ADJ NO. 23" of the electronic control just before where the video level "B" at TP9 (GND: E1) /PR board decreases less than 100 IRE (PAL; 700 mV).



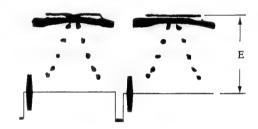
3. Adjust "ADJ NO. 17" of the electronic control just before where the video level "C" at TP9 (GND: E1) /PR board decreases than 100 IRE (PAL; 700 mV).



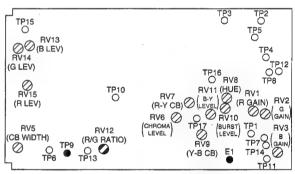
- 4. Lens iris → F4
- 5. Adjust "ADJ NO. 16" and "ADJ NO. 18" of the electronic control so that the carrier leakage "D" of white level portion at VIDEO OUT is minimum.



- 6. Lens iris  $\rightarrow$  F2.8 or F2
- 7. Adjust "ADJ NO. 8" of the electronic control so that the white clip level "E" at VIDEO OUT is 115 ± 2 IRE (PAL;  $805 \pm 10 \text{ mV}$ ).



8. Set the data of "ADJ No. 24" (Electronic control) to 255.



PR-158/158P BOARD (B SIDE)

# 5-2-13. Aperture Detail Adjustment

Subject: Resolution chart, Grayscale chart

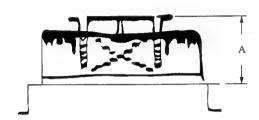
Equipment: B/W monitor screen, Waveform monitor,

Oscilloscope

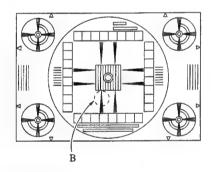
# **Adjustment Procedure:**

Subject: Resolution chart
 To be extended: PR-158/158P board

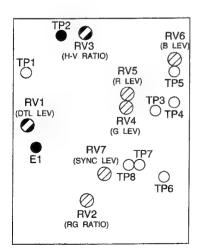
3. Adjust the lens iris so that the video level "A" at VIDEO OUT is  $100 \pm 2$  IRE (PAL;  $700 \pm 10$  mV).



- Set the data of "ADJ No. 27" (Electronic control) to 60.
   Set the data of "ADJ No. 25" (Electronic control) to 100.
   Set the data of "ADJ No. 26" (Electronic control) to 151.
- 5. Adjust RV12/PR board so that the highest resolution at portion "B" is obtained, observing the B/W monitor.

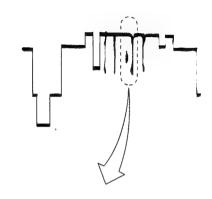


Select the 730 to 740 TV lines of the resolution chart with the "LINE SELECTOR" of the waveform monitor.



IF-354/354P BOARD (A SIDE)

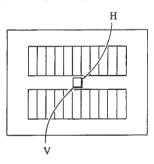
 Adjust "ADJ NO. 25" of the electronic control so that the modulation degree "C" is from 8 to 10 IRE (PAL; 56 to 70 mV).





- 8. Subject: Grayscale chart
- 9. To be extended: IF-354/354P board
- 10. Adjust **②** RV1/IF-354 (354P) board so that only **V** detail signal having appears at TP2 (GND: E1) /IF board.
- 11. Observing the white portion on the grayscale chart and adjust 
  ◆RV3/IF board so that the overlapping detail ratio of H to V on the grayscale is 2 to 1 on the monitor screen.

(Monitor)

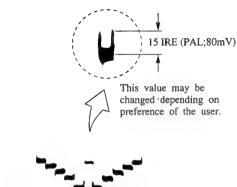


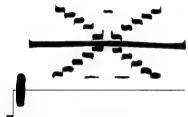
H: V = 2:1

12. Set the data of "ADJ No. 27" (Electronic control) to 120. Set the data of "ADJ No. 28" (Electronic control) to 120.

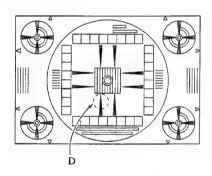
13. Adjust "ADJ NO. 28" of the electronic control so that the spikes (detail level during H period) at both ends of white level are 15 IRE (PAL; 80 mV).

This level can be changed according to the users' requirements.





- 14. Subject: Resolution chart
- 15. Adjust **⊘**RV2/IF board so that the highest resolution of portion "D" portion is obtained, observing the B/W monitor.



# 5-2-14. IRIS Adjustment

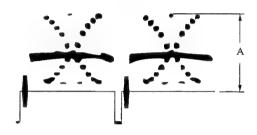
Subject: Grayscale chart
Equipment: Waveform monitor
To be extended: IF-354/354P board

Preparation:

• IRIS AUTO/MANU → "AUTO"

#### Adjustment Procedure:

 Adjust "ADJ NO. 30" of the electronic control so that the video level "A" at VIDEO OUT is 100 ± 2 IRE (PAL; 700 ± 10 mV).

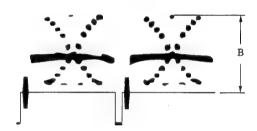


2. IRIS AUTO/MANU → MANU

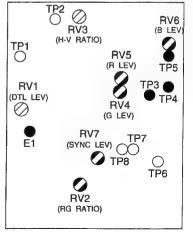
Lens iris → F2.8

CCD IRIS (Menu on the monitor screen) → ON

3. Adjust "ADJ NO. 32" of the electronic control so that the video level "B" at VIDEO OUT is  $105 \pm 2$  IRE (PAL;  $735 \pm 10$  mV).



- 4. CCD IRIS (Menu on the monitor screen) → OFF
- Set the data of "ADJ No. 37" (Electronic control) to 100.
   Set the data of "ADJ No. 38" (Electronic control) to 003.



IF-354/354P BOARD (A SIDE)

# 5-2-15. G OUT Level Adjustment

Equipment: Oscilloscope To be extended: IF-354/354P board

Preparation:

• Confirm that the "G. SYNC" (Menu on the monitor screen) is set to "ON".

DISPLAY/BARS button → "BARS"

• SW7 (SYNC/SG1) /CN-579 (580) board → "SYNC"

**Test point:** 

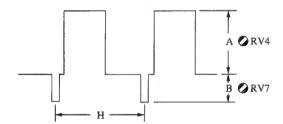
TP4 (GND: E1) /IF-354 (354P) board

Specification:

(75-ohm termination)

 $A = 714 \pm 10 \text{ mV (For NTSC)}$  $A = 700 \pm 10 \text{ mV}$  (For PAL) 

 $B = 286 \pm 5 \text{ mV (For NTSC)}$  $B = 300 \pm 5 \text{ mV (For PAL)}$ RV7/IF-354 (354P) board



# 5-2-16. R OUT Level Adjustment

Equipment:

Oscilloscope

To be extended: IF-354/354P board

Preparation:

• DISPLAY/BARS button → "BARS"

Test point:

TP3 (GND: E1)/IF-354 (354P) board

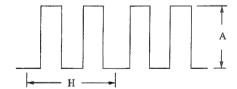
Adj. point:

**⊘** RV5/IF-354 (354P) board

Specification:

(75-ohm termination)

NTSC;  $A = 714 \pm 10 \text{ mV}$ PAL;  $A = 700 \pm 10 \text{ mV}$ 



#### 5-2-17. B OUT Level Adjustment

Equipment:

Oscilloscope

To be extended: IF-354/354P board

Preparation:

• DISPLAY/BARS button → "BARS"

Test point:

TP5 (GND: E1)/IF-354 (354P) board

Adj. point:

RV6/IF-354 (354P) board

Specification:

(75-ohm termination)

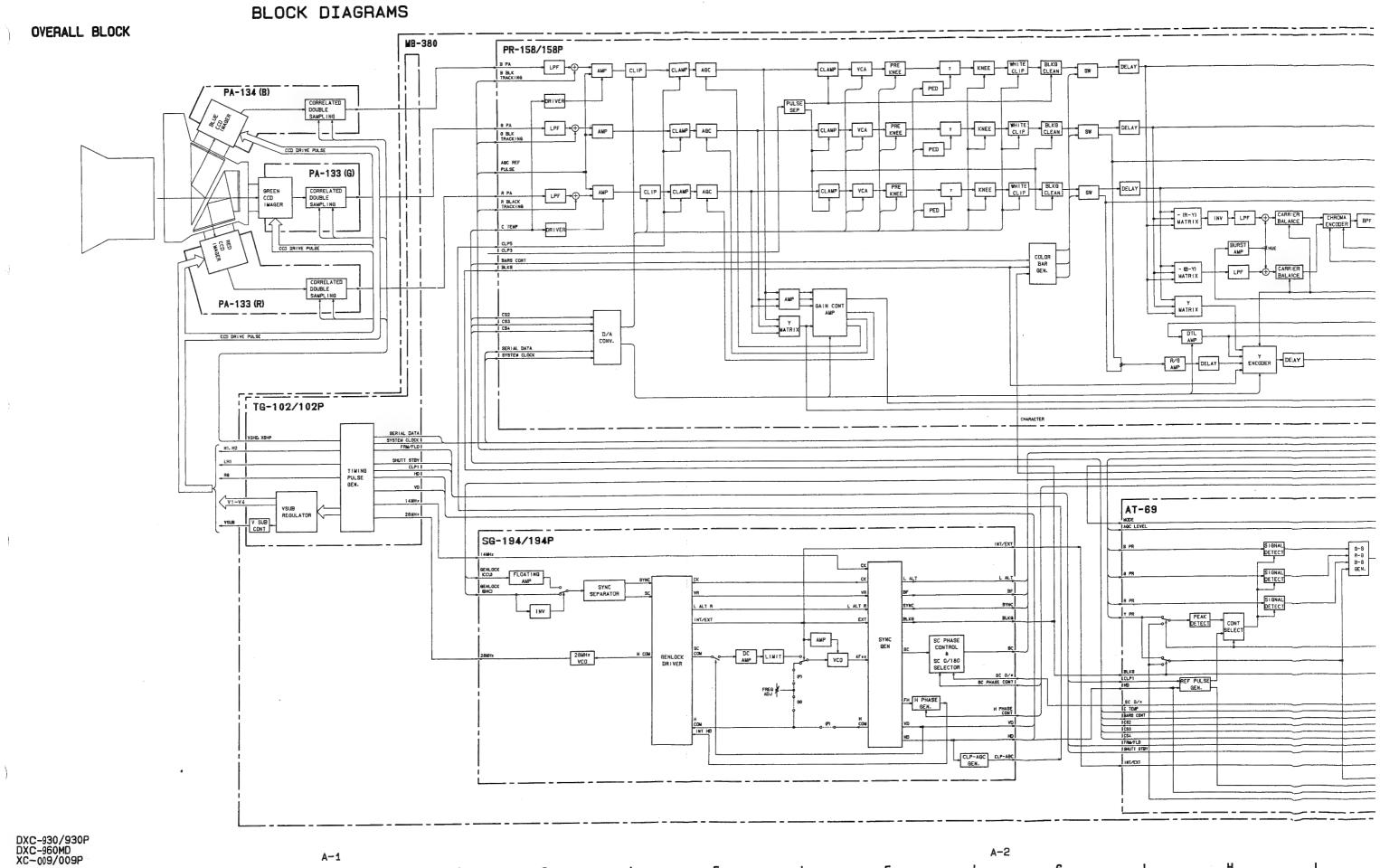
NTSC;  $A = 714 \pm 10 \text{ mV}$ PAL;  $A = 700 \pm 10 \text{ mV}$ 

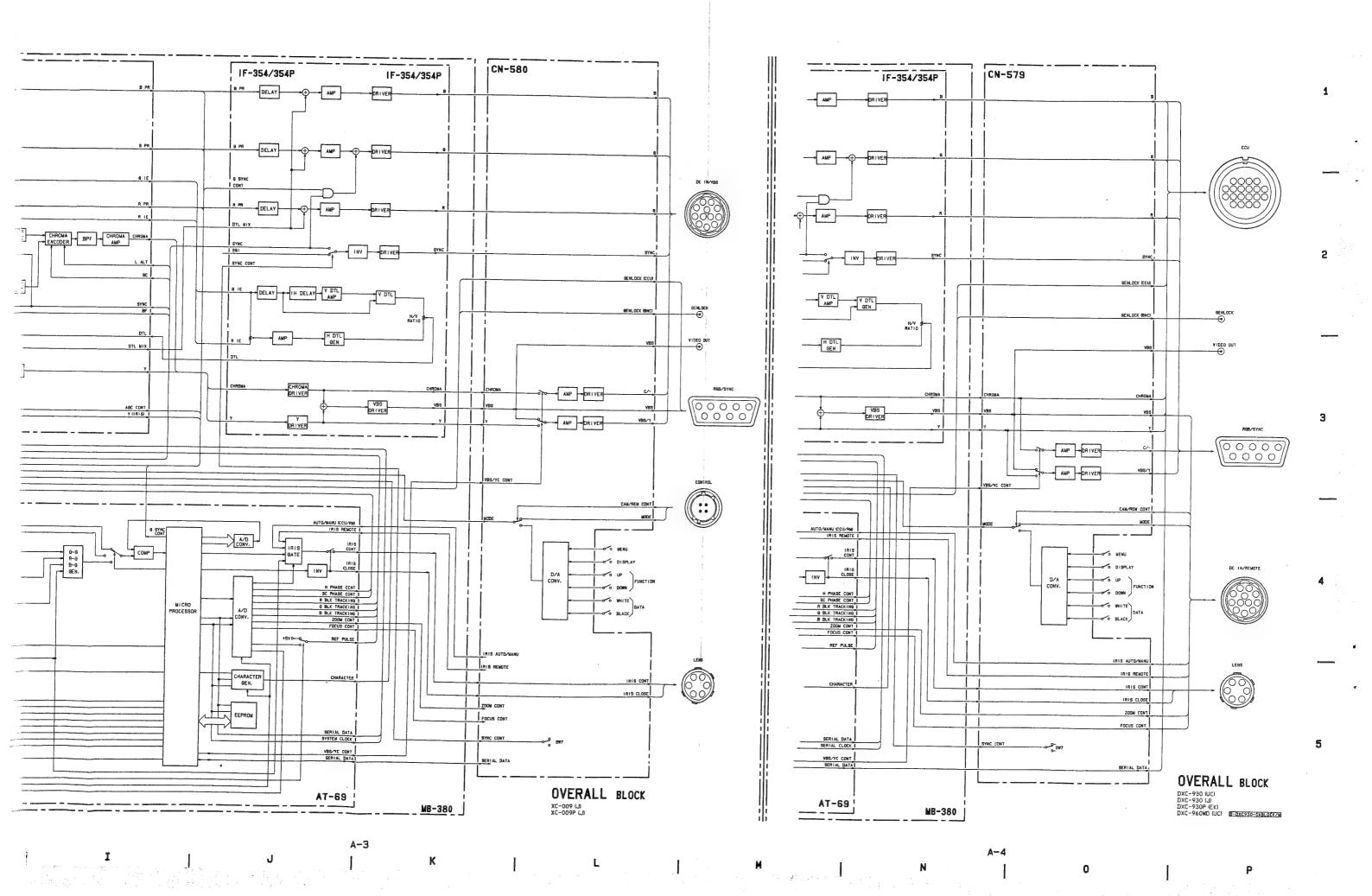


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SECTION A
BLOCK DIAGRAMS





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AT A)

2-6 18 SHUTT STB IN AT AI 2-8 19 SYSTEM CLOCK IN AT AI 2-10 SERIAL DATA IN TIMING PULSE GENERATOR OFOR R-CH, B-CH) BUFF RYS BIAS

TG-102/102P BLOCK

DXC-930 (UC)
DXC-930 (J)
DXC-930P (EK)
DXC-960MD (UC)
XC-009P (J)
XC-009P (J)

A-5

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TG-102/102P

TG-102/102P

A-7

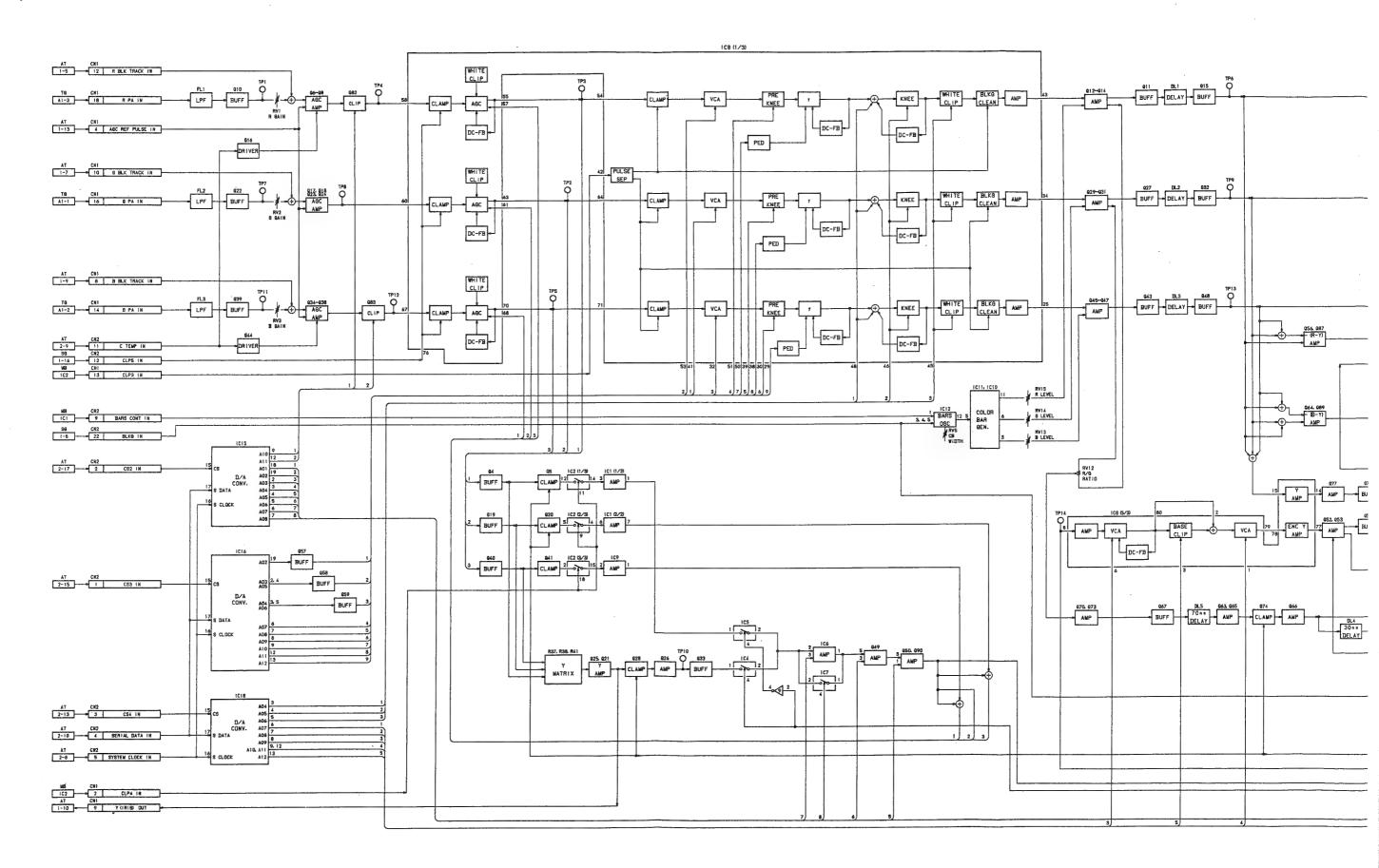
K

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DXC-930/930P DXC-960MD XC-009/009P

# PR-158/158P BLOCK

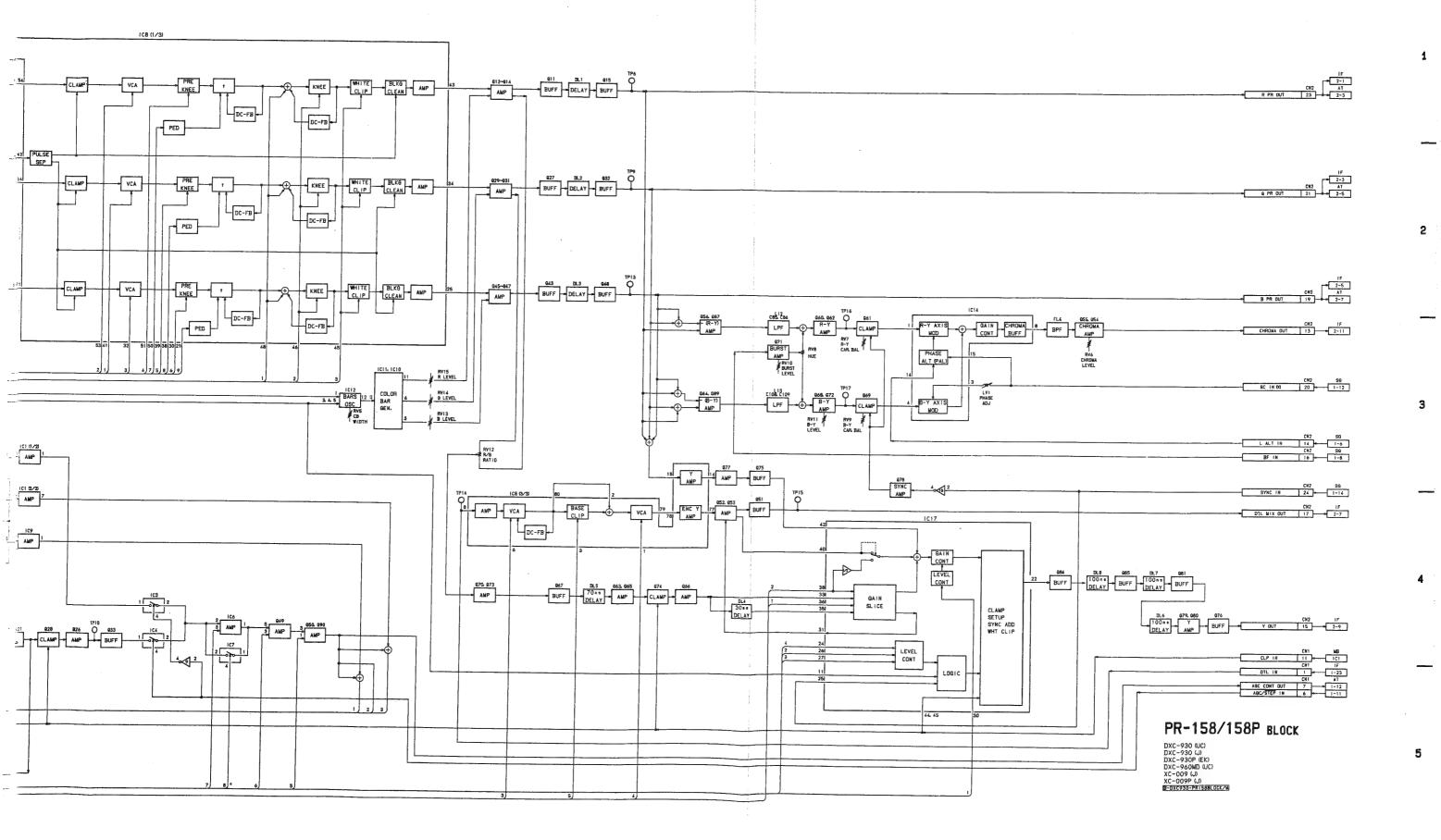


DXC-930/930P DXC-960MD XC-009/009P

A-9 I C I E

A-10 | **G** 

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A-10

A-11

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IF-354/354P BLOCK

AT CN3
1-22 22 | SYNC CONT (N 049 048 043 044 061 0 VBS DRIVER IF-354/354P BLOCK

A-12

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A-13

G

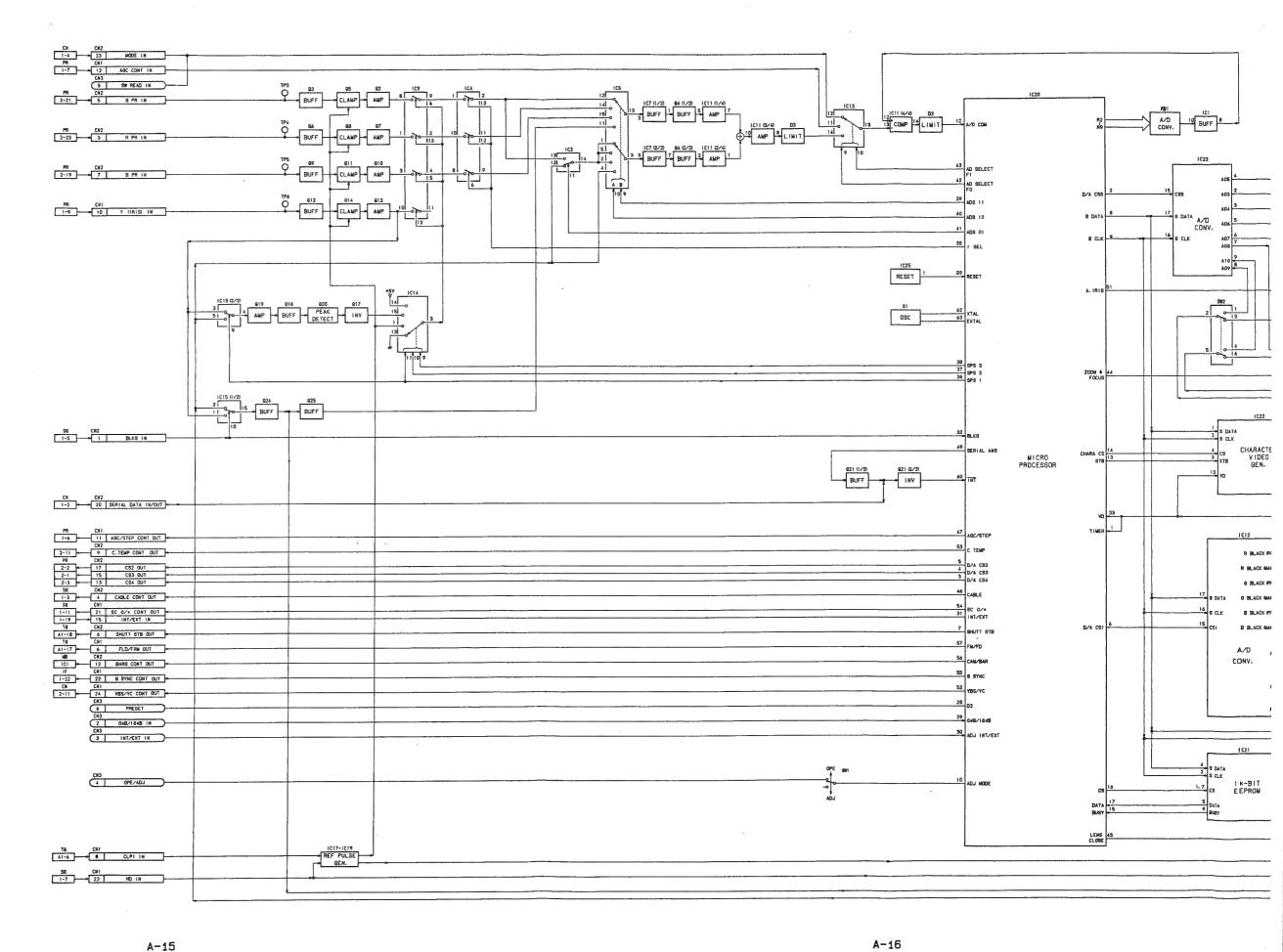
Ì

IF-354/354P

DXC-930/930P DXC-960MD XC-009/009P

A-14

AT-69 BLOCK



DXC-930/930P DXC-960MD XC-009/009P

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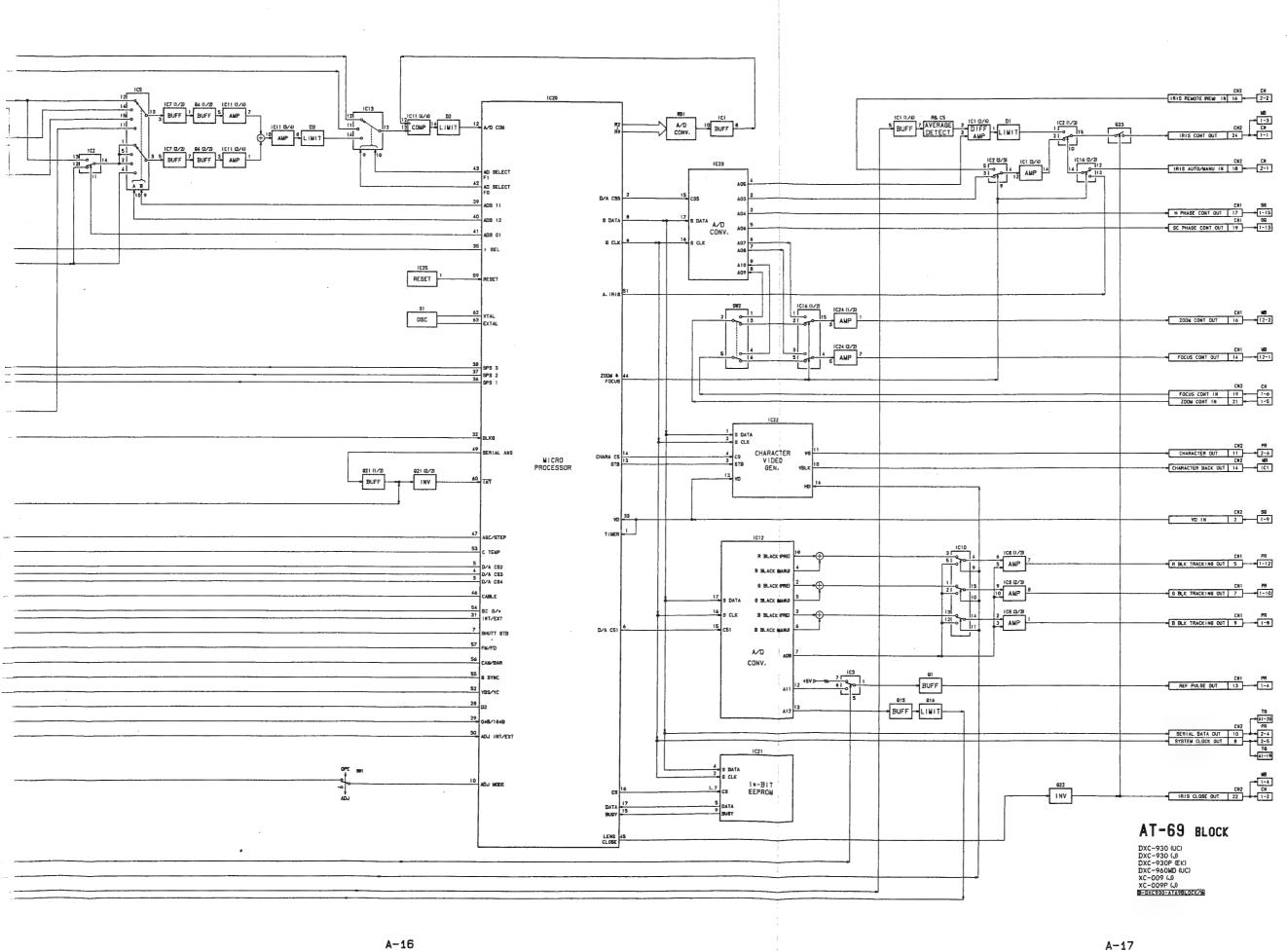
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T-69

AT-69

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SG-194/194P BLOCK

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SG-194/194P BLOCK

DXC-930 (UC)
DXC-930 (U)
DXC-930P (EK)
DXC-960MD (UC)
XC-009 (U)
XC-009P (U)
B-DXC930-96194BLDCK/

5

A-18

C

D

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A-19 I

G

SG-194/194P

DXC-930/930P DXC-960MD XC-009/009P

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A-50

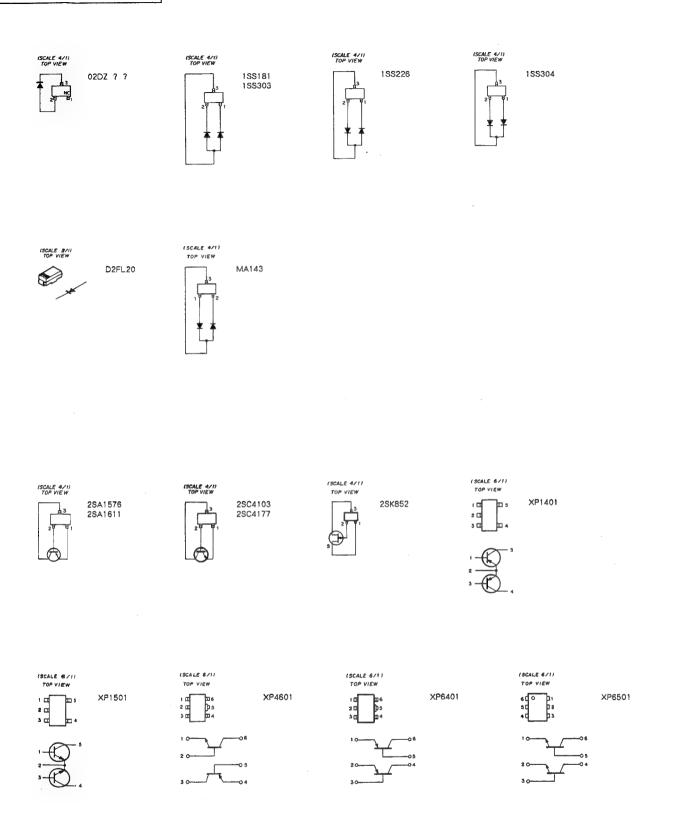
# SECTION B SEMICONDUCTOR

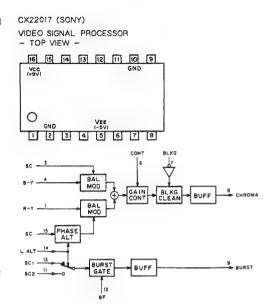
The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

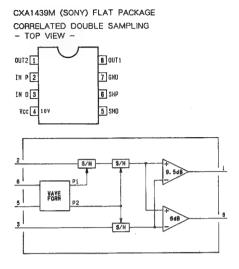
The chount diagram	01 10 15	Obtanio
TYPE	PAGE	
02DZ ? ?	····· B-2	
1SS181	····· B-2 ···· B-2	
2SA1576	····· B-2 ···· B-2	
2SC4103 ·······2SC4177 ·······	····· В-2 ···· В-2	
2\$K852	····· B-2	
CX22017	···· В-З	
CXA1439M CXA1592R	····· В-З ···· В-З	
CXD1216M CXD1217M CXD1250N CXD1256AR	····· B-4 ···· B-5	
CXL5504M	···· В-7	
D2FL20	····· B-2	
HD14053BFP HD63B05Y0E64F		
LM1881M	····· B-8	
M62352GP M6M80011AFP	B-9 B-9	
MA143	····· B-2	
MC14051BF	B-10 B-7 B-10 B-10	
NJM360M	····· B-10	
S-8054ALR-LN	····· B-11	
SC7S04F	····· B-11	
SN74HC00ANS SN74HC193ANS SN74HC27ANS SN74HC4066NS SN74HC74ANS SN74LS123NS	····· B-11 ···· B-11 ···· B-11 ···· B-12	

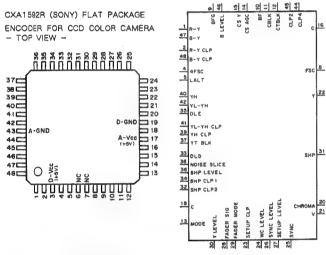
TYPE	PAGE
TC4S66F	B-12 B-12 B-12 B-10
TL062CPS TL064CNS TL084CNS	B-12
UPC2372GF-3B9 UPC358G2 UPC4558G2	B-14
UPD6142G-101 ·····	B-14
XP1401XP1501XP4601XP6401XP6501XP6501	B-2 B-2 B-2

# DIODE, TRANSISTOR



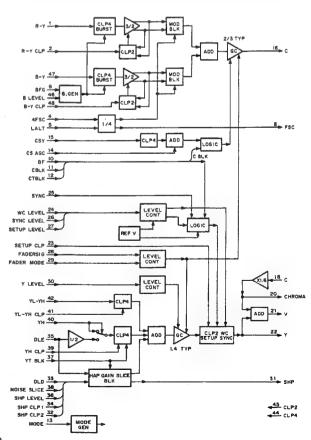


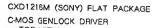


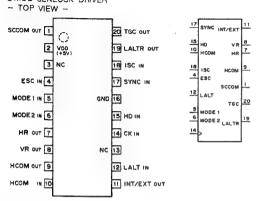


20 V. LE VE VE. 20 S. S. T. V.
INPUT 4FSC : 4FSC USED TO MAKE UP THE SUB CARRIER 8 LEVEL : CONTROLS THE BURST LEVEL 8 BF : BURST FLAG PULSE 8 INSERTS PULSE SLICHT LARGER THAN BF ON BOTH ENDS CBLK : COMPOSITE BLANKING PULSE CLP2, 4 FULSE INPUT FOR CHROMA SIGNAL PASSED THROUGH BPF CS AGC : SUPPRESS CHROMA SIGNAL AT THE AGC GAIN CONTROL SIGNAL CSY : SUPPRESS CHROMA SIGNAL AT THE Y SIGNAL CTBLK : CHROMA TITLER PULSE DLD : CONNECTS THE DELAY LINE DRIVE SIDE OF THE APERTURE SIGNAL DLE : CONNECTS THE DELAY LINE BON SIDE OF THE APERTURE SIGNAL FADER MODE : BLACK FADER AND WHITE FADER MODE SELECT FOOTROLS THE SIGNAL SUPPRESS LEVEL DURING WHITE FADER AND AT THE SAME TIME THE SIGNAL SUPPRESS LEVEL DURING WHITE FADER AND AT THE SAME TIME
CONTROLS THE SET UP LEVEL  ALT  MODE  SELECTS NTSC, PAL OR NTSC × 2, PAL × 2 MODES  NOISE SLICE  CONTROLS THE SLICE LEVEL OF THE APERTURE SIGNAL  RY, B-Y  RY, B-Y  CONNECTING THE CAPACITOR FOR R-Y, B-Y  SETUP LEVEL  CONNECTING THE CAPACITOR FOR R-Y, B-Y  MODULATOR CLAMP  SETUP LEVEL SET UP LEVEL CONTROL  SHP CLPI, E CONNECTS THE CLAMP CAPACITOR USED FOR THE SLICE OF THE APERTURE  SIGNAL  SIGNAL
SHP LEVEL CONTROL OF THE APERTURE SIGNAL LEVEL SYNC SYNC PULSE SYNC EVEL SYNC LEVEL CONTROL WC LEVEL WHITE CLIP LEVEL CONTROL Y LEVEL SYNC LEVEL CONTROL YH SIGNAL YH CLP CONNECTS THE CAPACITOR FOR YH INPUT CLAMP YL-YH CLP CONNECTS THE CAPACITOR FOR YL-YH SIGNALS YL-YH CLP CONNECTS THE CAPACITOR FOR YL-YH INPUT CLAMP YL-YH CLP CONNECTS THE CAPACITOR FOR YL-YH INPUT CLAMP YTBLK Y TITLER PULSE
OUTPUT C C: CHROMA SIGNAL OUTPUT CHROMA: CHROMA SIGNAL OUTPUT WHEN USED FOR Y/C SEPARATION OUTPUT FSC: CUTPUTS A SUB CARRIER WITH THE SAME PHASE AS B-Y SHP : APERTURE SIGNAL V : COMPOSITE VIDEO SIGNAL Y : Y SIGNAL OUTPUT WHEN USED FOR Y/C SEPARATION OUTPUT

PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL
1	1	R-Y	13	- 1	MODE	25	1 '	SYNC	37		YTBLK
2	1	R-Y CLP	14	F	CS AGC	26	1	SYNC LEVEL	38	1	NOISE SLICE
3	-	D-Vcc(+5V)	15	1	CSY	27		SETUP LEVEL	39	1	YH CLP
4	-1	4FSC	16	0	С	28		FADER SIG	40	1	YH
5	1	LALT	17	-	A-Vcc(+5V)	29	1	FADER MODE	41	1	YL-YH CLP
6	_	NC	18	1	Ç	30	1	Y LEVEL	42		YL-YH
7	-	NC	19		D-GND	31	0	SHP	43	-	A-GND
8	0	FSC	20	0	CHROMA	32	1 :	SHP CLP2	44	- 1	CLP4
9	-	BFG	21	0	V	33	1	DŁD	45	- 1	CLP2
10	1	8F	22	0	Y	34	1	SHP CLP1	46	1	B LEVEL
11	T	CBLK	23	1	SETUP CLP	35	1	DLE	47	1	8-Y
12	1	CTBLK	24	1	WC LEVEL	36	1	SHP LEVEL	48	1	B-Y CLP

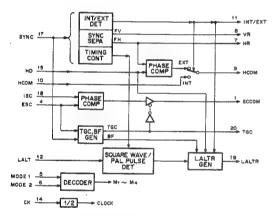






INF	TU <sup>2</sup>		01/000014
MODE1	MODE2	MODE	SYSTEM
0	0	M1	PAL-VBS
1	0	M2	PALM-VBS
0	1	M3	PALSECAM-VS/SC/LALT
1	1	M4	NTSC-VBS,NTSC-VS/SC PALM-VS/SC/LALT

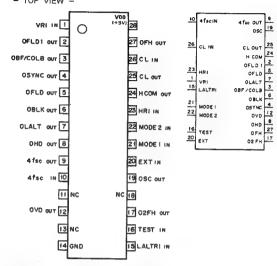
0 : LOW LEVEL 1 : HIGH LEVEL



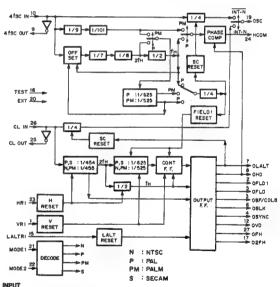
INPUT
CK : 45sc CLOCK INPUT
ESC : SC/COLOR BURST
HCOM : PHASE COMPARATE FROM CXD1217
HD : H DRIVE FROM CXD1217
ISC : SUBCARRIER FROM CXD1217
LALT : LALT FROM REFERENCE SIGNAL GENERATOR
MODE1,2 : SYSTEM SELECT
SYNC : SYNC FROM REFERENCE SIGNAL GENERATOR

OUTPUT
HCOM : PHASE COMPARATOR HR WITH HD
HR : 14 OF SYNC SEPARATE
INT/EXT : INTERNAL/EXTERNAL SPECIFIED
LALTR : LINE CHANGE RESET
SCCOM : PHASE COMPARATOR ESC WITH ISC
TGC : TRISTATE CONTROL
VR : 14 OF SYNC SEPARATE

#### CXD1217M (SONY) FLAT PACKAGE C-MOS SYNC GENERATOR - TOP VIEW -



SYSTEM	4fsc	CLOCK	1N9	TUT	S
NTSC	910fH	910h	MODE1	MODE2	•
PAL	1135fn+2fv	908fu	0	0	
PALM	909fн	910fн	0	1	
ECAM	~	908fu	1	0	
			1	1	



INPUT
4/SC IN
4/SC IN CLOCK INPUT
EXT
EXT
SYNC MODE SELECT
(L; INTERNAL/H; EXTERNAL)
HRI
LALTRI
LALTRI
LAUTRI
LAUT

VPH : V RESEI

OUT PUT

4/SC OUT : 4/SC OUTPUT

4/SC OUT : CLOCK OUTPUT

HCOM : PHASE COMPARATOR

02H : 2H OUTPUT

08F/COLE : BURST FLAG/COLOR BLANKING

08LK : COMPOSITE BLANKING

0FL : FREQUENCE

0FLD : EVEN. ODD

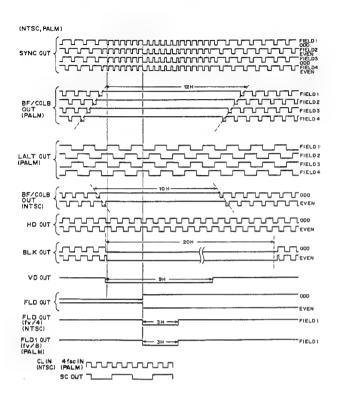
0FLD : FIELD!

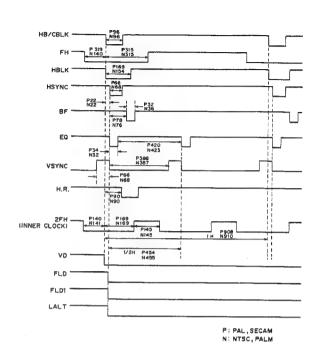
0HD : H DRIVE

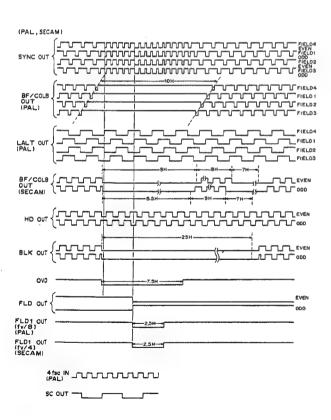
0SC : SUBCARRIER

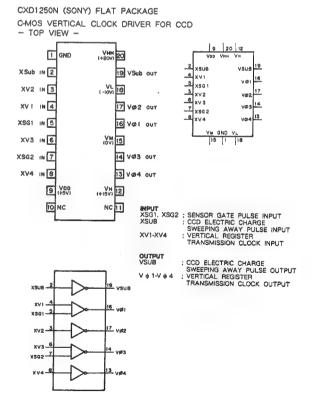
0SYNC : COMPOSITE SYNC

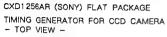
0VD : V DRIVE

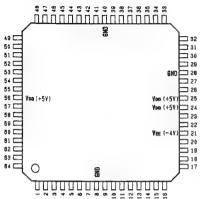




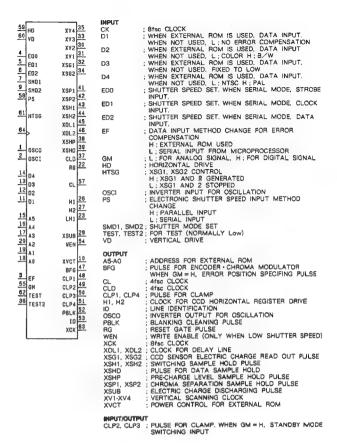








											(You =+5Y) (YEE =-4Y)
Pin No.	I/0	SYMBOL	Pin	1/0	SYMBOL	Pin No.	1/8	SYMBOL	Pin No.	1/0	SYMBOL
1	0	OSCO	17	0	A3	33	Q	XV3	49	1/0	CLP2
2	I	OSCI	18	0	AO	34	8	XS62	50	1/0	CLP3
3	I	EF	19	0	. A1	35	8	XV4	51	0	CLP4
4	1	EDO	20	0	A2	36	1	TEST2	52	0	PBLK
5	I	ED1	21	-	VEE	37	0	CFD	53	0	10
6	I	ED2	22	0	RG	38	8	XSHP	54	0	VEN
7	ī	SMD1	23	-	LHI	39	0	XSHD	55	I	6M
8	-	GND	24	-	You	40	-	GND	56	-	Yee
8	1	SM02	25	-	You	41	0	XSP1	57	0	CL
10	0	XYCT	26	0	H1	42	8	XSP2	58	1	PS
11	I	Di	27	0	H2	43	0	XSH1	59	I	HO
12	_1	D2	28	-	GND	44	8	XSH2	60	1	YO
13	I	03	29	.0	XSUB	45	0	XOL1	61	1	HTSG
14	1	04	30	0	XV2	46	0	XDL2	62	I	TEST
15	0	. A5	31	0	XV1	47	0	BFG	63	0	XCK
16	0	A4	32	0	XS61	48	0	CLP1	64	I	CK

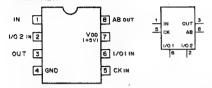


15 A5 16 A4 17 A3 18 A0 19 A1 20 A2 DEFECT ADR COUNT RAM CUNTER D2 12 13 MODE GATE - ED0 5 ED I 6 ED 2 7 SMO 1 9 SMD 2 58 PS GM 55 LATCH SHUT. 30 XV2 31 XV1 32 XSG1 33 XV3 34 XSG2 35 XV4 COUNTER 10 XVCT 47 8FG 48 CLP1 49 CLP2 50 CLP3 51 CLP4 52 PBLK 53 ID GATE HD INITIALIZE DECODE 34 WEN
29 XSUB
3 EF
39 XSHD
37 CLD
22 RG
46 XDL2
45 XOL1
47 XSH2
43 XSH1
42 XSP1
43 XSP1
41 XSP2
41 XSP1
23 LH1
27 H2 GATE 1/2 osco -TEST -62 TEST2 36

B-6

#### CXL5504M (SONY)

C-MOS CCD 1H DELAY LINE - TOP VIEW -



AB ; AUTO BIAS DC OUTPUT I/O1,1/O2; I/O CONTROL 1,2 INPUTS CK ; CLOCK INPUT OUT ; SIGNAL OUTPUT IN ; SIGNAL INPUT

I/O I I/O 2

- Je J2

CONTROL

CIRCUIT

AUTO BIAS

CIRCUIT

CCC

(1,30-BIT)

OUTPUT

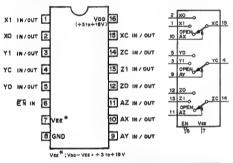
GROUT

3-OUT

HD14053BFP (HITACHI) FLAT PACKAGE MC14053BF (MOTOROLA) FLAT PACKAGE

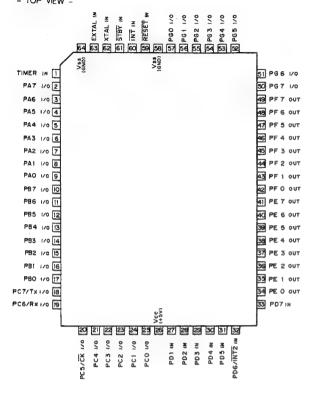
SELF BIAS CIRCUIT

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS - TOP VIEW -



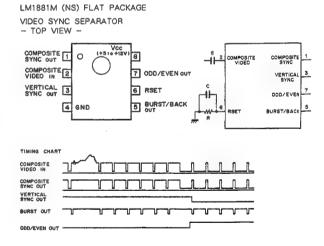
O; LOW LEVEL C O S S OPEN CARE.

#### HD63B05Y0E64F (HITACHI) FLAT PACKAGE C-MOS 8-BIT MICROPROCESSOR UNIT - TOP VIEW -



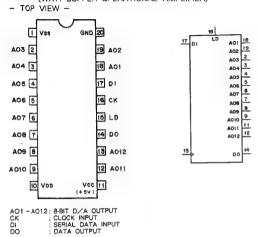
PAO-PAT PORT A	NDEX REGISTER  NDEX REGISTER  REGISTER  STACK POINTER  PHIGHT PREGRAM COUNTER  PHIGHT PERCENA COUNTER  "LOW PE	
P80~F87 FORT 8	59 RE 61 ST 60 IN	
PCS/CK 201 PONT C PCS/RK 19 PCT/TX 19 PCT/TX 19 SERIAL CONTROL REGISTER	62 XT.	AL
OATA REGISTER SERIAL STATUS REGISTER MEGISTER	TIMER / PRESCALER TIMER CONTROL	4ER
PD07 PD0/INTZ PD1~PD5	PORT E 34~41  PEO~ PET  PORT F PFO~ PFT	
256 SYTE RAM 7872 SYTE	PORT 9 PGQ~PG7	

27 P01 PEO 34 PAO PAT : B-BIT I/O PORT A
28 P02 PE1 35 PCO PCT : B-BIT I/O PORT C
29 P03 PE2 35 PCO PCT : B-BIT I/O PORT C
30 P04 PES 37 PEO PET : B-BIT I/O PORT C
31 P05 PE 38 PEC PET : B-BIT I/O PORT C
32 P06/INT2 PES 39 PGO PGT : B-BIT I/O PORT E
32 P06/INT2 PES 39 PGO PGT : B-BIT I/O PORT G
32 POS/INT2 PES 39 PGO PGT : B-BIT I/O PORT G
33 POT PE6 40 STBY : B-BIT I/O PORT G
33 POT PE6 41 INT INTERRUPT IN INTERRUPT

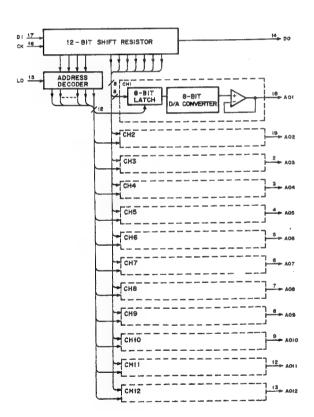


#### M62352GP (MITSUBISHI) FLAT PACKAGE

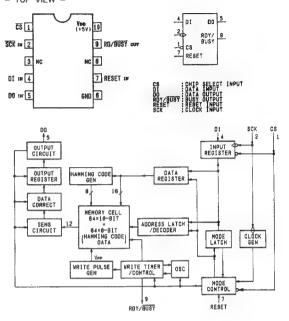
C-MOS 8-BITx12 CHANNEL D/A CONVERTER (WITH BUFFER OPERATIONAL AMPLIFIER)



NOTE: 3.5V < Vpp < Vcc - 3.5V < Vss < Vcc

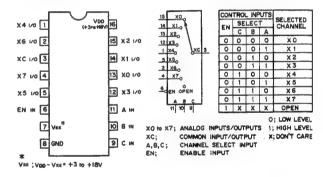


## M6M80011AFP (MITSUBISHI) FLAT PACKAGE C-MOS 1k (64x16) BIT ERASABLE PROM



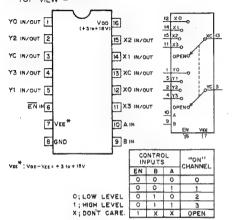
# MC14051BF (MOTOROLA) FLAT PACKAGE

C-MOS 8-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER — TOP VIEW —

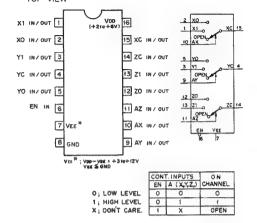


#### MC14052BF (MOTOROLA) FLAT PACKAGE

C-MOS DUAL 4-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS - TOP VIEW



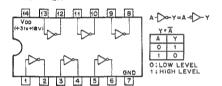
C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER - TOP VIEW



MC74HC4053F (MOTOROLA) FLAT PACKAGE

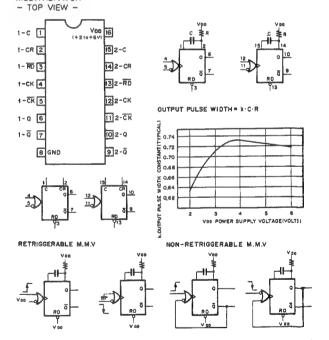
#### MC14069UBF (MOTOROLA)

C-MOS INVERTER - TOP VIEW -



TC74HC4538AF (TOSHIBA) FLAT PACKAGE

C - MOS DUAL RETRIGGERABLE / NON - RETRIGGERABLE MONOSTABLE MULTIVIBRATOR



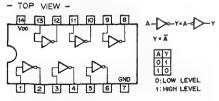
MC34182M (MOTOROLA) FLAT PACKAGE TL062CPS (TI) FLAT PACKAGE

OPERATIONAL AMPLIFIER (JFET INPUT) - TOP VIEW



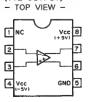
#### MC74AC04M (MOTOROLA) FLAT PACKAGE

C-MOS HEX INVERTERS



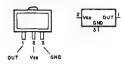
OTE:	
TYPE	Von
74HCT04 TYPE	+5V
TC74AC04 TYPE	+2 to +5.5V
74ACT04 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

#### NJM360M (JRC) FLAT PACKAGE HIGH SPEED VOLTAGE COMPARATOR (TTL OUTPUT)



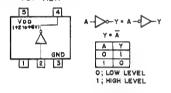
#### S-8054ALR-LN (SEIKO)

C-MOS VOLTAGE DETECTOR - TOP VIEW -

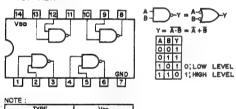


SC7S04F (MOTOROLA) FLAT PACKAGE TC7S04F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER - TOP VIEW -



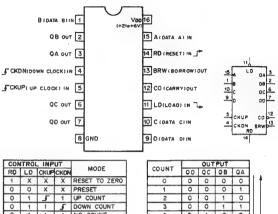
SN74HC00ANS (TI) FLAT PACKAGE C-MOS QUAD 2-INPUT NAND GATES - TOP VIEW -

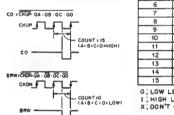


NOTE :	
TYPE	Voo
TC74AC00 TYPE	+2 to +5.5V
MC74HCT00N	+5V
74ACT00 TYPE	+4.5 ■ +5.5∨
OTHER TYPES	+2 in +6V

#### SN74HC193ANS (TI) FLAT PACKAGE

C-MOS PRESETTABLE SYNCHRONOUS 4-BIT UP/DOWN COUNTER - TOP VIEW -

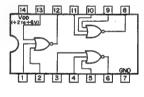


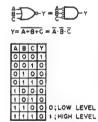


0 1 1 1 NO COUN

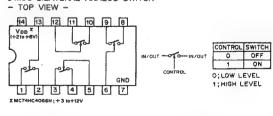
	-		_	-	1 h A		
0	0	0	0	0	ΙΙΤ		
1	0	0	0	1	111		
2	0	0	1	0	]		
3	0	0	1	1	]		
4	0	1	0	0			
5	0	_ 1	0	1	Ϊ́Ε		
6	0	1	1	0	COUNT		
7	0	.1	1	1	اق د ا		
8	1	0	0	0	5		
9	1_	0	0	.1	50		
10	1	0	1	0	119		
- 11	1	0	1	1	111		
12	1	1	0	0	]		
13	1	1	0	1	H		
14	1	1	1	0	11		
15	1	1	1	1	14		
O; LOW LEVEL 1; HIGH LEVEL X; DON'T CARE							

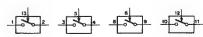
SN74HC27ANS (TI) FLAT PACKAGE C-MOS 3-LINE POSITIVE-NOR GATE - TOP VIEW -





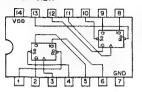
SN74HC4066NS (TI) FLAT PACKAGE C-MOS BILATERAL ANALOG SWITCH



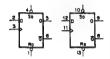


#### SN74HC74ANS (TI) FLAT PACKAGE

C-MOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET - TOP VIEW -



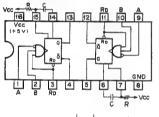
	PU		OUTF						
Šō	Rο	CK	D	Qn+i	Qn+1				
0	1	X	Х	1	0				
1	0	X	Х	0	1				
0	0	X	Х	1	1				
T	1	5	1	1	0				
1	1	F	0	0	1				
1	1	0	X	Qn	Qn				
0;	O:LOW LEVEL								
1;	1; HIGH LEVEL								
x;	00	N'I		ARE					

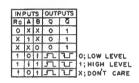


NOTE:	
TYPE	Voo
TC74HCT74AF	+5V
TC74AC74 TYPE	+2 to +5.5V
74ACT74 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

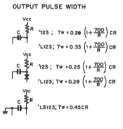
#### SN74LS123NS (TI) FLAT PACKAGE

TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET









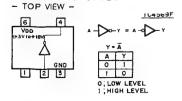


## TC4S66F (TOSHIBA)

C-MOS BILATERAL ANALOG SWITCH - TOP VIEW -

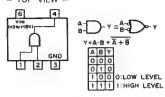


### TC4S69F (TOSHIBA) FLAT PACKAGE C-MOS INVERTER BUFFER



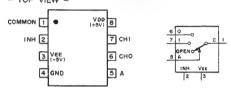
# TC4S81F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE - TOP VIEW --



#### TC4W53F (TOSHIBA) FLAT PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER DEMULTIPLEXER - TOP VIEW -



	CONT.	ON	
	INH	A	CHANNEL
	0	0	0
0 : LOW LEVEL 1 : HIGH LEVEL	0	1	1
X : DON'T CARE	1	Х	OPEN

### TL064CNS (TI) FLAT PACKAGE OPERATIONAL AMPLIFIER

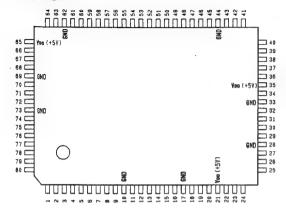
(J FET-INPUT) - TOP VIEW -

#### TL084CNS (TI) FLAT PACKAGE OPERATIONAL AMPLIFIER (J FETHNPUT)

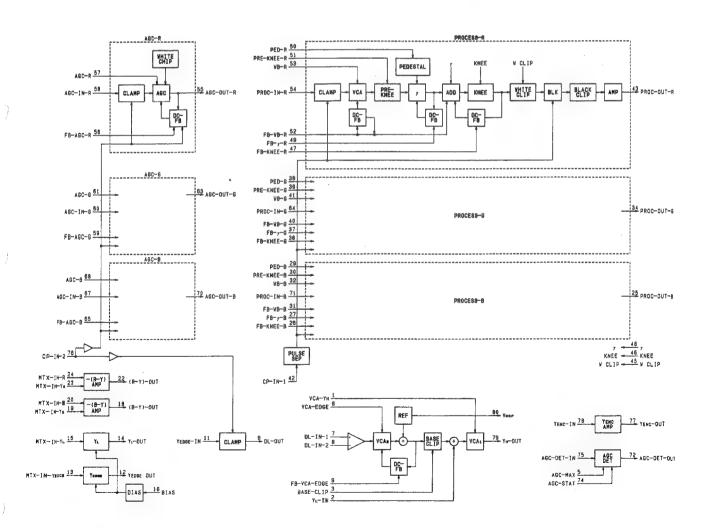
- TOP VIEW -- 14 13 12 11 10 9 8

4

UPC2372GF-3B9 (NEC) FLAT PACKAGE 3-CH PROCESS AMP & AGC -- TOP VIEW --



											(VDD = + 5V)
PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL	PIN No.	1/0	SYMBOL
1	1	VCA-YH	21	-	VDD	41	1	WB-G	61	I	AGC-G
2	- 1	YL-IN	22	0	(R-Y)-OUT	42	1	CP4N-1	62	-	GND
3	1	BASE-CLIP	23	1	MTX-IN-YR	43	0	PROC-OUT-R	63	0	AGC-OUT-G
4	1	FB-VCA-EDGE	24	T	MTX-IN-R	44	-	GND	64	I	PROC-IN-G
5	1	AGC-MAX	25	0	PROC-OUT-B	45	1	WCLIP	65	- 1	FB-AGC-B
6	1	VCA-EDGE	26	T	FB-KNEE-B	46	1	KNEE	66	-	VDD
7	-	DL-IN1	27	T	F8-Y-8	47	1	FB-KNEE-R	67	1	AGC+N-B
8		DL-IN2	28	-	GND	48	1	Y	68	ŀ	AGC-B
9	0	DL-OUT	29	1	PED-B	49	-	FB-Y-R	69	-	GND
10	-	GND	30	1	Pre-KNEE-B	50	- 1	PED-R	70	0	AGC-OUT-B
11	I	YEDGE IN	31	1	FB-W8-8	51	í	Pre-KNEE-R	71	1	PROC-IN-B
12	0	YEDGE OUT	32	1	W8-B	52	1	FB-WB-R	72	0	AGC-DET-OUT
13	. 1	MTX-IN-YEDGE	33	-	GND	53	-1	W8-R	73	-	GND
14	0	YL-OUT	34	0	PROC-OUT-G	54	1	PROC-IN-R	74	1	AGC STAT
15	- 1	MIX-IN-YL	35	-	Voo	55	0	AGC-OUT-R	75	1	AGC-DET-IN
16	0	BIAS	36	T	FB-KNEE-G	56	1	FB-AGC-R	76	- 1	CP-IN-2
17	-	GND	37	1	FB-Y-G	57	-	AGC-R	77	0	YENC-OUT
18	0	(B-Y)-OUT	38	T	PED-G	58	-	AGC-IN-R	78	. 1	YENC-IN
19	1	MTX-IN-Ye	39	1	Pre-KNEE-G	59	1	FB-AGC-G	79	0	Y#OUT
20	l i	MTX-IN-B	40	1	F8-W8-G	60	1	AGC-IN-G	80	0	VREF



: AGC THRESHOLD CONTROL

AGC GAIN CONTROL FOR BCH

AGC GAIN CONTROL FOR G-CH

BCH AGC

G-CH AGC

G-CH AGC

G-CH AGC

G-CH AGC

G-CH AGC

G-CH AGC

AGC MAX GAIN CONTROL

AGC GAIN CONTROL

BASE CLIP CUNTITY CONTROL

EOG COMPENSATION SIGNALLISE

CLAMP PULSE FOR AGC GIRCUIT

HONNIVERT INPUT FOR HORIZONTAL EDGE

COMPENSATION DIFFERENTIAL AMPLIFIER

INVERT INPUT FOR HORIZONTAL EDGE

COMPENSATION DIFFERENTIAL AMPLIFIER

COMPENSATION DIFFERENTIAL AMPLIFIER

COMPENSATION DIFFERENTIAL AMPLIFIER

COFEEDBACK FOR BCH AGC

DC FEEDBACK FOR BCH WHITE BALANCE

UWHITE BALANCE CONTROL FOR BCH

PWKNEE CONTROL FOR BCH

WHITE BALANCE CONTROL FOR BCH

WHITE INPUT
AGC STAT
AGC-B
AGC-DET-IN
AGC-G
AGC-IN-B
AGC-IN-G
AGC-IN-R
AGC-IN-R
AGC-MAX
AGC-R
BASE-CLIP CP-IN-1 CP-IN-2 DL-IN1 DI-IN2 DL-IN2
FB-AGC-B
FB-AGC-G
FB-AGC-G
FB-AGC-G
FB-AGC-G
FB-KNEE-G
FB-KNEE
KNEE
KNEE
MTX-IN-B
MTX-IN-B
MTX-IN-P
M MTX-IN-YL MTX-IN-YR PED-B PED-B PED-R Pro-KNEE-B Pro-KNEE-B PROC-IN-B PROC-IN-G PROC-IN-G VCA-EDGE VCA-YH W8-8 WB-G W8-R WCLIP YEDGE IN YENC-IN OUTPUT
AGC-DET-OUT
AGC-OUT-G
AGC-OUT-R
BIAS
DL-OUT : AGC DETECT
BCH AGC
GCH AGC
GCH AGC
IRCH AGC
BIAS
HORIZONTAL EDGE COMPENSATION SIGNAL FOR
LUMINANCE SIGNAL
BCH PROCESS
GCH PROCESS
YREF (2.0V)
MATRIX OF LUMINANCE SIGNAL FOR HORIZONTAL
EDGE COMPENSATION
LUMINANCE SIGNAL FOR HORIZONTAL
EDGE COMPENSATION
LUMINANCE SIGNAL FOR HORIZONTAL
EDGE COMPENSATION
LUMINANCE SIGNAL AMPLIFIER
OUTPUT OF APARTURE COMPENSATION CIRCUIT
LUMINANCE SIGNAL MATRIX
LUMINANCE SIGNAL MATRIX
RY SIGNAL MATRIX
RY SIGNAL MATRIX

UPC358G2 (NEC) FLAT PACKAGE DUAL OPERATIONAL AMPLIFIERS TOP VIEW -



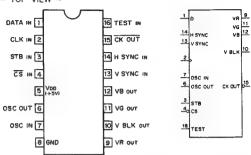
PROC-OUT-B PROC-OUT-G PROC-OUT-R VREF YEDGE-OUT

YENC-OUT YH-OUT YL-OUT (B-Y)-OUT (R-Y)-OUT

UPC4558G2 (NEC) FLAT PACKAGE DUAL OPERATIONAL AMPLIFIER - TOP VIEW -



UPD6142G-101 (NEC) FLAT PACKAGE C-MOS 8-BIT SERIALL INPUT CHARACTER DISPLAY TOP VIEW



D; DATA INPUT

CK OUT; EQUAL TO OUTPUT OF OSC OUT

CLK; CLOCK INPUT

CS; CHIP SELECT INPUT

H SYNC; H SYNC INPUT

OSC IN, OUT; EXTERNAL TERMINAL FOR OSC

STB; STROBE INPUT

TEST; TEST CLOCK INPUT

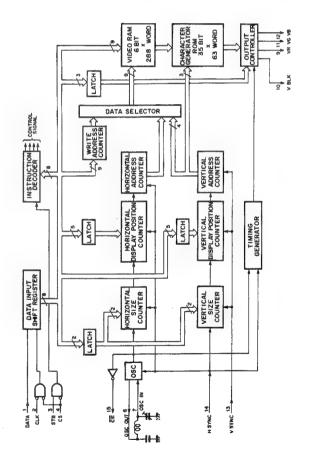
VB; BLUE CHARACTER DATA OUTPUT

VB; BLUE CHARACTER DATA OUTPUT

VG; GREEN CHARACTER DATA OUTPUT

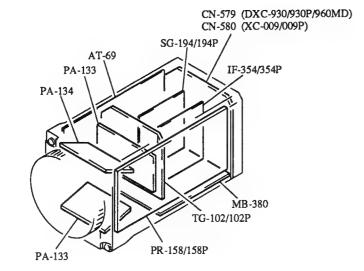
VR; RED CHARACTER DATA OUTPUT

V SYNC; V SYNC INPUT



# SECTION C SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

**BOARD LAYOUT** 



DXC-930/930P DXC-960MD XC-009/009P

C-1

C

D

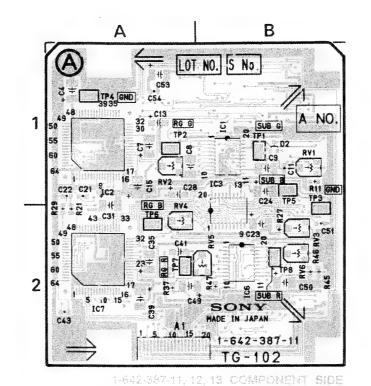
E

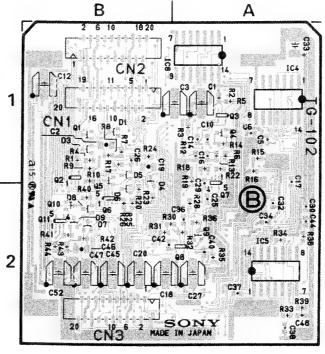
C-5

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# TG-102/102P BOARD





TG-102/102P (1-642-387-11, 12, 13) CN1 CN2 CN3 B-1 B-1 B-2 B-1 B-1 B-1 B-1 B-1 B-2 B-2 B-2 D1 D2 D3 D4 D5 D6 D7 D8 D9 IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8 B-1 A-1 B-1 A-2 B-2 A-2 A-1 Q1 Q2 Q3 Q5 Q6 Q7 Q8 Q9 Q10 Q11 B-1 B-1 B-1 B-2 A-1 A-2 A-2 B-2 B-2 RV1 RV2 RV3 RV4 RV5 A-1 B-2 A-2 B-2 B-2 RV6 TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 B-1 A-1 B-2 A-1 B-1 A-2 A-2 B-2

1-642-387-11, 12, 13 SOLDERING SIDE

DXC-930/930P DXC-960MD XC-009/009P

C-3

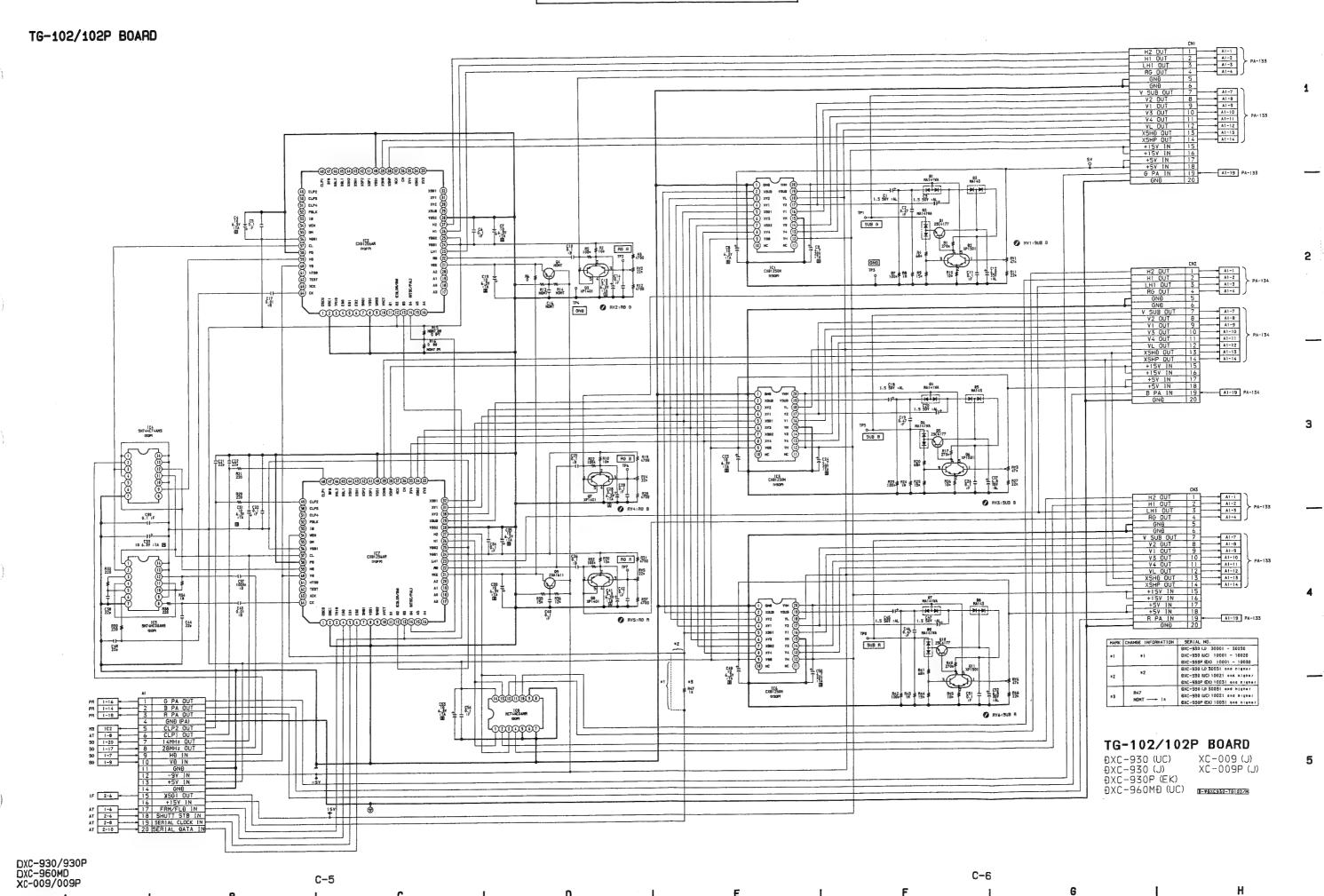
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PR-158/158P BOARD

D-3

A-3 A-2 A-2 D-2 D-2 Q79

Q80

Q82

Q83 Q84 Q85 B-2

B-3

B-2

Q15

Q16

Q17 Q18

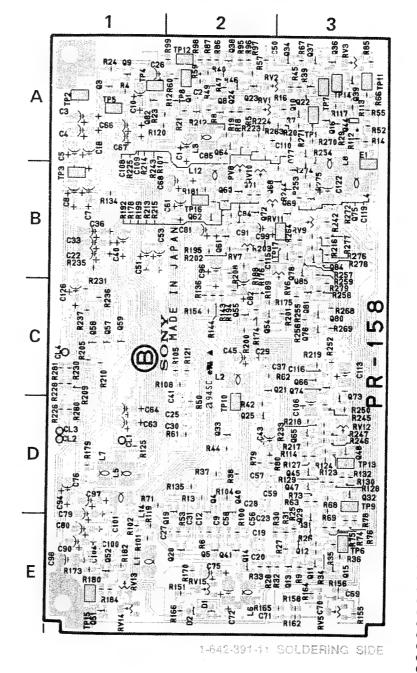
Q19

Q20

1

Serial No. 30001-30280 DXC-930 (J)
10001-10270 DXC-930 (UC)
10001-10480 DXC-930P (EK)
10001-10050 DXC-960MD (UC)
10001-10170 XC-009 (J)
10001-10060 XC-009P (EK)

PR-158/158P (1-642-391-11) 3 2 A-2 RV1 C55 \$ C54 2 8 8 Q23 A-2 A-2 C-2 C-2 D-3 C-2 D-3 C-2 D-3 C-2 A-2 A-2 A-3 A-2 A-3 RV2 A-2 Q24 RV3 A-3 C21 R48 Q25 Q26 Q27 Q28 Q30 Q31 Q32 Q33 Q34 Q35 Q36 Q37 Q38 Q39 Q40 Q41 Q42 Q43 Q44 Q45 RV5 D-3 D-3 RV6 D-3 RV7 B-2 DL4 D-1 RV8 A-2 DL5 C-3 RV9 A-2 DL6 B-2 RV10 A-2 DL7 B-2 RV11 A-2 DL8 B-2 C-3 D-1 RV12 C111 R227 C8 RV13 D1 D-2 RV14 D-1 D2 D-2 RV15 D-2 E1 A-3 TP1 A-2 TP2 A-1 FL1 A-2 TP3 A-1 FL2 FL3 FL4 A-2 D-2 TP4 **A**-1 TP5 TP6 TP7 TP8 TP9 TP10 A-3 D-2 B-2 D-3 D-3 A-3 A-2 D-3 C-2 A-3 A-2 D-3 A-3 D-1 A-2 IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8 IC9 A-3 D-2 D-2 Q46 Q47 C-2 C-3 TP11 TP12 C-2 D-2 Q48 Q49 Q50 Q51 Q52 C-2 C-2 C-3 TP13 TP14 TP15 TP16 C-1 C-1 C-1 B-1 D-1 C-2 D-1 Q53 Q54 IC10 D-2 D-1 TP17 IC11 D-2 B-2 IC12 D-3 C-1 Q55 B-2 IC13 Q56 A-2 IC14 B-2 Q57 B-1 IC15 D-1 Q58 B-1 D IC16 C-1 Q59 B-1 Q60 A-2 IC18 B-1 Q61 B-2 Q62 A-2 C-3 LV1 A-2 Q63 A-2 C-2 C-2 Q64 Q1 A-2 Q65 Q66 A-2 Q3 Q67 C-3 A-2 Q4 Q5 Q68 D-2 A-2 Ε Q69 B-2 C-3 Q70 A-2 A-2 Q71 A-2 B-2 Q72 Q9 A-1 D-3 C-3 Q73 Q10 A-2 Q74 Q11 D-3 Q75 A-2 1-642-391-11 COMPONENT SIDE D-2 Q12 Q76 Q77 B-3 D-2 Q13 A-2 D-2 Q14 Q78 B-2



PR-1	58/158P	1-642-391-11)
CN1 CN2	A-3 B-3	Q22 A-2 Q23 A-2 Q24 A-2
DL1 DL2 DL3 DL4 DL5 DL6 DL7 DL8	D-3 D-3 D-3 D-1 C-3 B-2 B-2	Q25 C-2 Q26 C-2 Q27 D-3 Q28 C-2 Q29 D-2 Q30 D-3 Q31 D-2 Q32 D-3
D1 D2	D-2 D-2	Q33 C-2 Q34 A-2 Q35 A-2
E1	A-3	Q36 A-3 Q37 A-2 Q38 A-2
FL1 FL2 FL3 FL4	A-2 A-2 A-3 B-2	Q39 A-3 Q40 D-2 Q41 D-2 Q42 D-1
IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8 IC9 IC10 IC11 IC12 IC13 IC14 IC15 IC16 IC17 IC18	D-2 D-2 C-2 C-2 C-2 C-1 B-1 C-2 D-2 D-3 C-1 B-2 D-1 C-1 D-1 B-1	Q43 D-3 Q44 A-3 Q45 D-2 Q46 C-3 Q47 D-2 Q48 C-3 Q49 C-1 Q50 C-1 Q51 D-1 Q52 D-1 Q53 D-1 Q53 D-1 Q54 B-2 Q55 B-2 Q56 A-2 Q57 B-1 Q58 B-1 Q59 B-1 Q60 A-2 Q61 B-2 Q62 A-2 Q63 C-3
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q17 Q18 Q19 Q20 Q21	A-2 A-2 D-2 A-2 D-2 A-2 A-2 D-3 D-2 D-2 D-3 A-3 A-2 D-2 D-2 D-2 D-2 D-2 D-2 D-2 D-2 D-2 D	Q64 A-2 Q65 C-2 Q66 C-2 Q66 C-2 Q67 C-3 Q68 A-2 Q69 B-2 Q70 C-3 Q71 A-2 Q72 B-2 Q73 D-3 Q74 C-3 Q75 A-2 Q76 B-3 Q77 A-2 Q78 B-2 Q79 B-2 Q80 B-3 Q81 B-2 Q82 A-1 Q83 A-1 Q84 B-2 Q85 B-2

C-8 (a)

RV5

RV7

RV8

RV9

RV10

RV11

RV12

RV<sub>13</sub>

RV14

RV15

TP1

TP2 TP3 TP4 TP5

TP6 TP7

TP9

TP10

TP11

TP12

TP13

TP14

TP15

TP16

TP17

D-3

B-2

B-2

A-2

A-2

A-2 C-3 D-1 D-1

D-2

A-1

A-1

A-2



PR-158/158P BOARD

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A-2 A-2 D-2

D-2

Q19 Q20

Q21

Q78 Q79 Q80 Q81 Q82 Q83 Q84 Q85

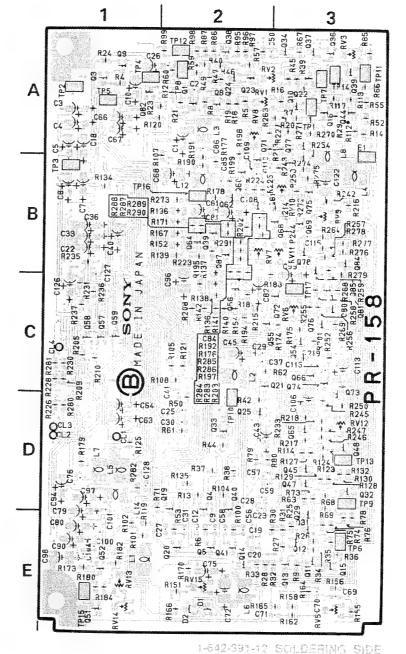
B-2 B-3 B-2 A-1 A-1

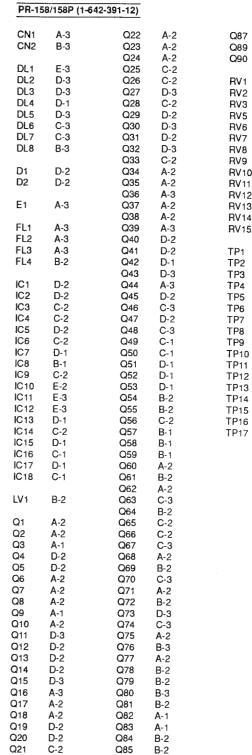
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B-2

Serial No. 30281-30480 DXC-930 (J) 10271-10570 DXC-930 (UC) 10481-10980 DXC-930P (EK) 10051-10250 DXC-960MD (UC) 10171-10320 XC-009 (J) 10061-10110 XC-009P (EK)

DD.1	59/450D /-	1-642-391-12)							
							3	2	1
CN1 CN2	A-3 B-3	Q22 Q23	A-2 A-2	Q87 Q89	B-2 B-2		C 2 F1399 8 C55	R 654 R 68 R 6 9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	£ + C52 →
DL1	E-3	Q24 Q25	A-2 C-2	Q90	C-1		FL2	54 C34 621R48	+, C35 C17
DL2	D-3	Q26	C-2	RV1	A-2			16 + 1 + 1	# E + + _
DL3	D-3	Q27	D-3	RV2	A-2	Α	RIS	Q7 R56 Q17 R22 Q18	- + + + 1 25
DL4	D-1	Q28	C-2	RV3	A-2 A-3	A		- 1. · · · · · - · · · · · · · · · · · · ·	√±1±Ω c24 + 25
DL5	D-3	Q29	D-2	RV5	D-3			2 1 20 1 2 0	2 + 1
DL6	C-3	Q30	D-3	RV6	B-2		N N N N N N N N N N N N N N N N N N N	7 R3 C16 ₹	g <sup>Cl3</sup> 70
DL7	C-3	Q31	D-3	RV7			1 - 4	### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ### + ##	rU.
DL8	B-3	Q32	D-3	RV8	B-2 A-2		Ci4		
		Q33	C-2	RV9	A-2 A-2		C6 J	Citi o	
D1	D-2	Q34	A-2	RV10	B-3		2 + 1	(688	
D2	D-2	Q35	A-2	RV11			: C117	L13	5 1
		Q36	A-3	RV12	A-2		N + - 1	( C47 7 C47	
E1	A-3	Q37	A-2		C-3		- C119 R241	T and Of Street Street Brown	2 2
		Q38	A-2	RV13 RV14	D-1 D-1	В	C118, 1	8 1 R206 €	
FL1	A-3	Q39	A-3	RV14 RV15	D-1 D-2		r 1 - + 16 + .	送个下针132ml	.eewo. ∠ Z
FL2	A-3	Q40	D-2	N 15	D-2				
FL3	A-3	Q41	D-2 D-2	TP1	۸.٥		G 2.1		
FL4	B-2	Q42	D-1	TP2	A-2 A-1		9757	C91	ICB 108
		Q43	D-3	TP3	A-1 A-1		72.	7 7 7	The N
IC1	D-2	Q44	A-3	TP4			2 (12 5 = 5)		ψ CG OZ
IC2	D-2	Q45	D-2		A-1		22 0 23 1 23 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TC18
IC3	C-2	Q45 Q46	C-3	TP5	A-1		52 + = #	R 22	+23+ ->
IC4	C-2	Q46 Q47	D-2	TP6	D-3			( 20 9	Salarian TO St. Lat. TO
IC5	D-2	Q47 Q48	C-3	TP7	A-3		F 85 C1	21 00 5	R261 R262 ≥
IC6	C-2	Q48 Q49		TP8	A-2	C	86 A	20200	1 D N N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
IC7	D-1	Q50	C-1	TP9	D-3		processing and an extension of the same	R229	R185R186
IC8	B-1	Q50 Q51	C-1 D-1	TP10	C-2		N R221 N N N N N N N N N N N N N N N N N N	DCC	=R106 R207- 0 N 30
IC9	C-2	Q51 Q52	D-1 D-1	TP11	A-3		R221 22 22 20 0	026 R82	COS RY
IC10	E-2	Q52 Q53		TP12	A-2	- 1			
IC11	E-3	Q53 Q54	D-1 B-2	TP13	D-3		R83	928 T O	-23 J
C12	E-3	Q55		TP14	A-3	1	1238 1 7   R248 + C112	+ 1 1 1 2	
C13	D-1	Q56	B-2 C-2	TP15	D-1		C102 · + +	RR 2 5 1 4	5 - 2
C14	C-2	Q57	B-1	TP16	A-2		R251 1 +2 - PR1260		1 200
C15	D-1	Q58	B-1	TP17	B-2	1	R131		ωω.
C16	C-1	Q59	B-1			D	R131	1+ 1/1 + 1 1+	50 0 0
C17	D-1	Q60	A-2			וט	p == 1 (2 o o o o o	C44Q	
C18	C-1	Q61	B-2				° 7 7 7 5°°₁	49 841 R109 + R11	1 R110 \( \sigma \)
010	0.1	Q62	A-2			- 1	R115 4 930 2+ II	CI 16 IC2	المالية المالية
.V1	B-2	Q63	C-3				N/ 1 R72 p	4 5 5 5 6 6 6 6 6 8 12	2 6
	5 2	Q64	B-2			L	ULZ		642 36 37 36 37
21	A-2	Q65	C-2				C32 +	And the second s	5 7
22	A-2	Q66					R64 N +	10°	309
33	A-2 A-1	Q67	C-2 C-3				2 2 1	4 1	25-1-9
24	D-2	Q68	A-2				CHARLES		
25	D-2 D-2	Q69	B-2				14 1C12 8 16 IC11	9 C73 14 IC10 8 R1	53 S R239 N
26	A-2					F			R157 6 6 C78 1 R240
27	A-2	Q70 Q71	C-3 A-2						-ω+ #
28	A-2	Q71	B-2				S Instrument Constitutions	+ + + + + + + + + + + + + + + + + + + +	R168
19	A-1	Q73	D-3				TEARESE ECES	F # 2 F # 2 F F F F F F F F F F F F F F	- ω τ/s ω τ/s
10	A-2	Q74	C-3				2027222 20033	The state of the s	R169 R169
111	D-3	Q75	A-2					The second secon	966 2
112	D-2	Q76	B-3					a can non a co	MARRIAGE AT THE COMMENT
13	D-2	Q77	A-2					7-642-391-12	COMPONENT SIDE
14	D-2	Q78	B-2						
15	D-3	Q79	B-2						
16	A-3	Q80	B-3						
17	A-2	Q81	B-2						
18	A-2	Q82	A-1						
10	D-2	002	7						





C-7 (b)

C-8 (b)

DXC-930/930P DXC-960MD XC-009/009P

Н

Q87

Q89

Q90

RV1

RV2

RV3

RV5

RV6 RV7

RV8

RV9

RV10

RV11

RV12

RV13

RV14

RV15

TP2

TP3

TP4

TP5

B-2

B-2

C-1

A-3

D-3

B-2

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A-2 B-3

A-2 C-3 D-1

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A-1

A-1

A-1

D-3

A-3

A-2 D-3 C-2 A-3 A-2 D-3 A-3 D-1 A-2 B-2

• - - PR-158/158P BOARD

Q1

Q3 Q4

Q5 Q6

Q7

Q8

Q9 Q10

Q11

Q12

Q13

Q14

Q15

Q18

Q19

Q20

D-2

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A-3

A-2

A-2

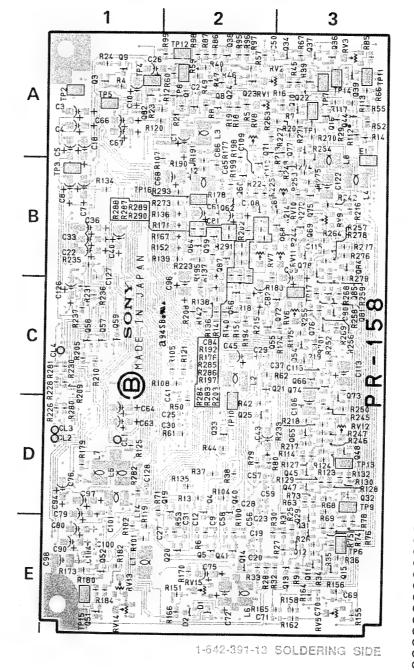
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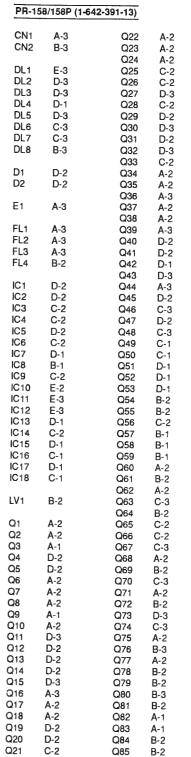
D-2

C-2

Serial No. 30481-10571-10981-50001-10251-10321-DXC-930 (J) DXC-930 (UC) DXC-930P (EK) DXC-960MD (UC) XC-009 (J) XC-009P (EK) 10111-

PR-1	58/158P (1-642	-391-13)				3   2   1
CN1 CN2	A-3 B-3	Q22 Q23 Q24	A-2 A-2	Q87 Q89	B-2 B-2	R92 2 Ft3 93 4 C55
DL1 DL2	E-3 D-3	Q25 Q26	A-2 C-2 C-2	Q90 RV1	C-1 A-2	R295 FLZ R54 C34 C21R48 + + (35 + +(
DL3	D-3	Q27	D-3	RV2	A-2 /	R294 = 07 R56, Q17 R22 Q18 + + + + + 1 22
DL4 DL5	D-1 D-3	Q28	C-2	RV3	A-3	1 1 2 1 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4
DL5	C-3	Q29 Q30	D-2 D-3	RV5	D-3	50 R11 C16 3 C C17
DL7	C-3	Q30	D-3 D-2	RV6 RV7	B-2 B-2	THE FLOOR PROPERTY OF THE PROP
DL8	B-3	Q32	D-3	RV8	A-2	the city of the ci
		Q33	C-2	RV9	A-2	- C111 5
D1	D-2	Q34	A-2	RV10	B-3	C117 11 11 12 13 25 17
D2	D-2	Q35	A-2	RV11	A-2	, 1. C 714 14 2 00 2 1
E1	A-3	Q36 Q37	A-3 A-2		C-3	The state of the s
	71.0	Q38	A-2		D-1 D-1 <b>E</b>	CITS CON LYIN
FL1	A-3	Q39	A-3		D-2	
FL2	A-3	Q40	D-2			0.05
FL3	A-3	Q41	D-2		A-2	095.59 3.56 2.57 2.57 2.57 2.57 2.57 2.57 2.57 2.57
FL4	B-2	Q42 Q43	D-1 D-3		A-1	Letter 4 - deet 1 N To 1 A See To 1 See
IC1	D-2	Q43	A-3		A-1 A-1	2 C120 + + R / S
IC2	D-2	Q45	D-2		A-1	The state of the s
IC3	C-2	Q46	C-3		D-3	
IC4	C-2	Q47	D-2		A-3	9261 9362
IC5 IC6	D-2 C-2	Q48	C-3		A-2 C	8 R261 R262 A
IC7	D-1	Q49 Q50	C-1 C-1		D-3	D R187 R185R186 R185R186 T R185R1
IC8	B-1	Q51	D-1		C-2 A-3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
IC9	C-2	Q52	D-1	-	A-2	8221 N N N Q Q Q R R R R R R R R R R R R R R
IC10	E-2	Q53	D-1		D-3	06 Red 128 - 15 0
IC11 IC12	E-3 E-3	Q54 Q55	B-2		4-3	
IC13	D-1	Q56	B-2 C-2		)-1 \-2	C102 - 2 + 1 - 23
IC14	C-2	Q57	B-1		1-2 3-2	R25  11
IC 15	D-1	Q58	B-1			R(3) 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
IC 16	C-1	Q59	B-1		D	
IC 17 IC 18	D-1 C-1	Q60 Q61	A-2 B-2			46 R41-R109 - R110 - C
.0 10	•	Q62	A-2			030 8+ IC1 16 1C2
LV1	B-2	Q63	C-3			0(2 872 8 872 8 8 8 8 8 8 8 8 8 8 8 8 8 8
_		Q64	B-2		******	
Q1	A-2	Q65	C-2			PROCESS OF THE PROCES
Q2 Q3	A-2 A-1	Q66 Q67	C-2			8 22
Q4	D-2	Q68	C-3 A-2			Constitution of the second of
Q5	D-2	Q69	B-2		_	14 ° 1C12 8 16 C11 9 ° C7314 ° 1C10 8 153 ° R239 C78 18 R240
Q6	A-2	Q70	C-3		E	R157 2 2 1 4 1 8240
Q7	A-2	Q71	A-2			
Q8	A-2	Q72	B-2			8 8 8
Q9 Q10	A-1	Q73	D-3			A TO THE PROPERTY OF THE PROPE
Q10 Q11	A-2 D-3	Q74 Q75	C-3			7 5569 7
Q12	D-3 D-2	Q76	A-2 B-3			1.840.004.40 CARESONES CONT
Q13	D-2	Q77	Δ-2			1-642-391-13 COMPONENT SIDE





C-7 (c)

C

C-8 (c)

DXC-930/930P DXC-960MD XC-009/009P

Q87

Q89

Q90

RV1

RV2

RV3

RV5

RV6

RV7

RV8

RV9

RV10

RV11

RV12

RV13

RV14

RV15

TP1

TP2 TP3 TP4

TP5

TP6 TP7

TP8 TP9 TP10 TP11 TP12

TP13

TP14

TP15

TP16

TP17

B-2

C-1

A-2

A-2

A-3

D-3

B-2

B-2 A-2 A-2 B-3 A-2 C-3 D-1

D-2

A-2

A-1 A-1

A-1 D-3

A-3

A-2 D-3

C-2

A-3

A-2

D-3

A-3 D-1

В

Q77

Q78

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Q82

Q83

Q84

A-2 B-2 B-2

B-3

B-2

A-1

A-1

B-2

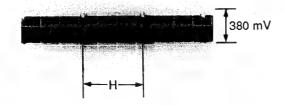
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## PR-158/158P BOARD

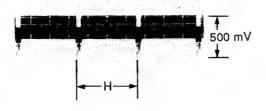
## NOTE:

- All voltage are DC, measured with a digital voltmeter.
- DC 電圧はデジタル電圧計による値
- DISPLAY/BARS bottom → "BARS"
- GAIN :00DB
- C. TEMP :3200K
- WHT. BAL :AUTO
- R GAIN :+00
- B GAIN :+00
- CCD IRIS :OFF
- SHUTTER :OFF

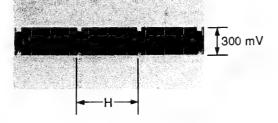
# PR, CN1-18 R PA (LENS: CLOSE)



PR, CN1-16 G PA (LENS: CLOSE)



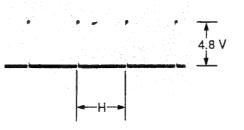
PR, CN1-14 B PA (LENS: CLOSE)



PR, CN2-20 SC



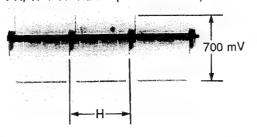
PR, CN2-16 BF



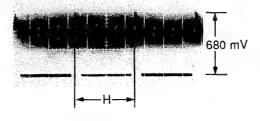
PR, CN2-14 L ALT



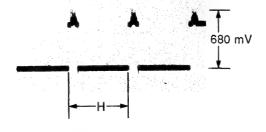
PR, TP4 R VIDEO (LENS: CLOSE)



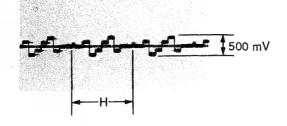
PR, TP8 G VIDEO (LENS: CLOSE)



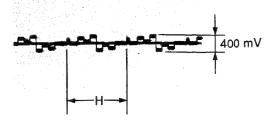
PR, TP12 B VIDEO (LENS: CLOSE)



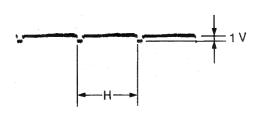
PR, TP16 R-Y



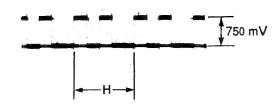
PR, TP17 B-Y



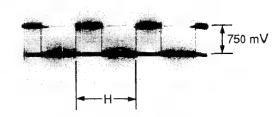
PR, CN1-9



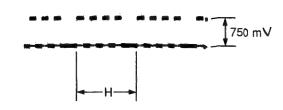
PR, TP6 R PR

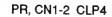


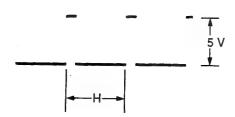
PR, TP9 G PR



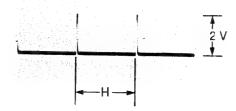
PR, TP13 B PR



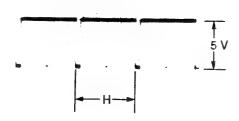




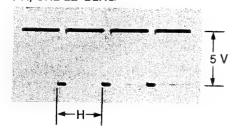
PR, CN1-13 CLP3



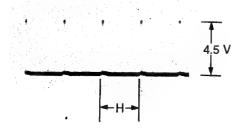
PR, CN2-24 SYNC



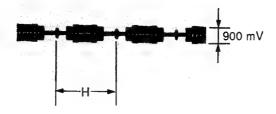
PR, CN2-22 BLKG



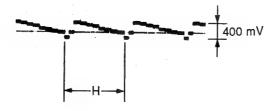
PR, CN1-11 CLP



PR, CN2-13 CHROMA



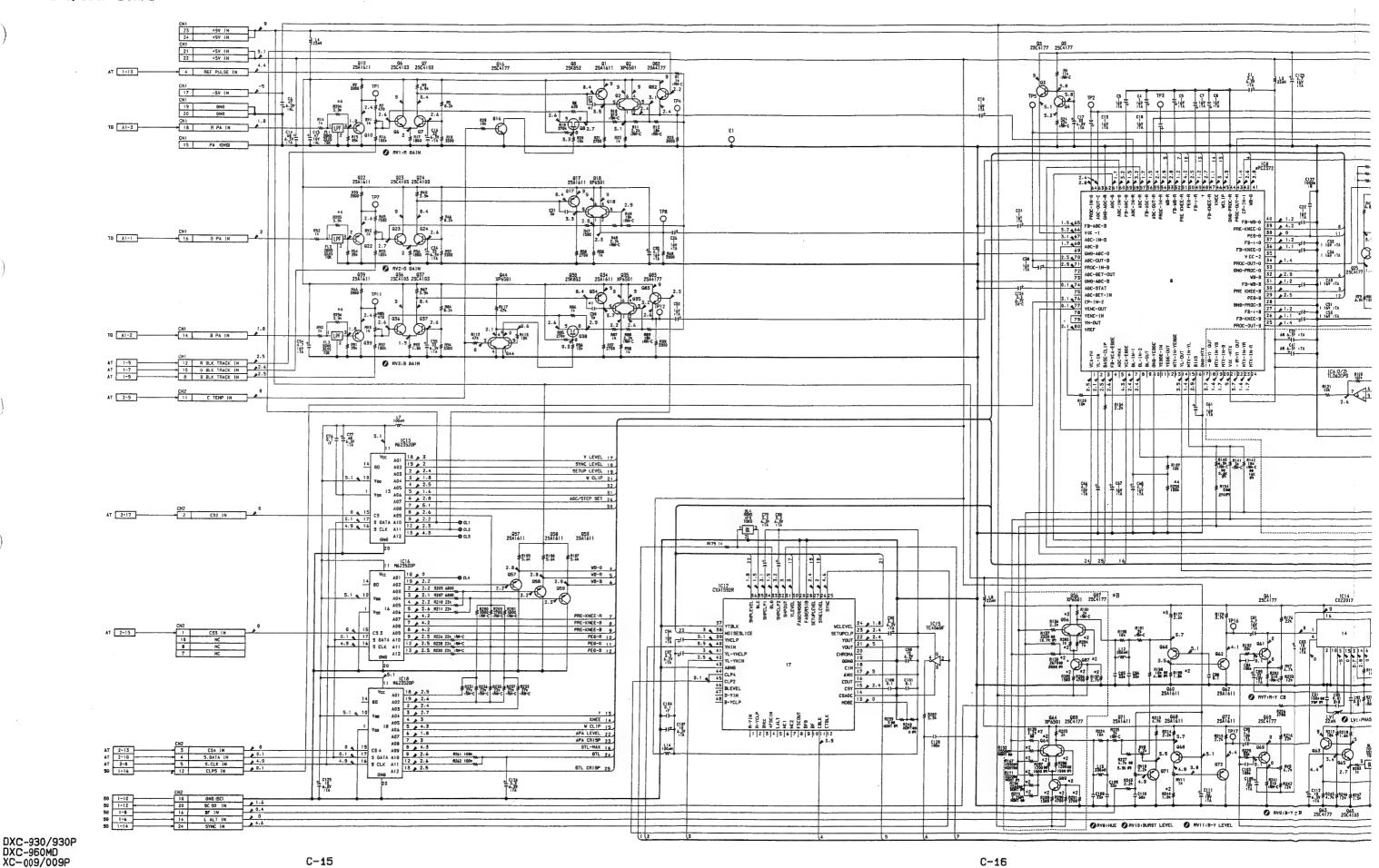
PR, CN2-15 Y

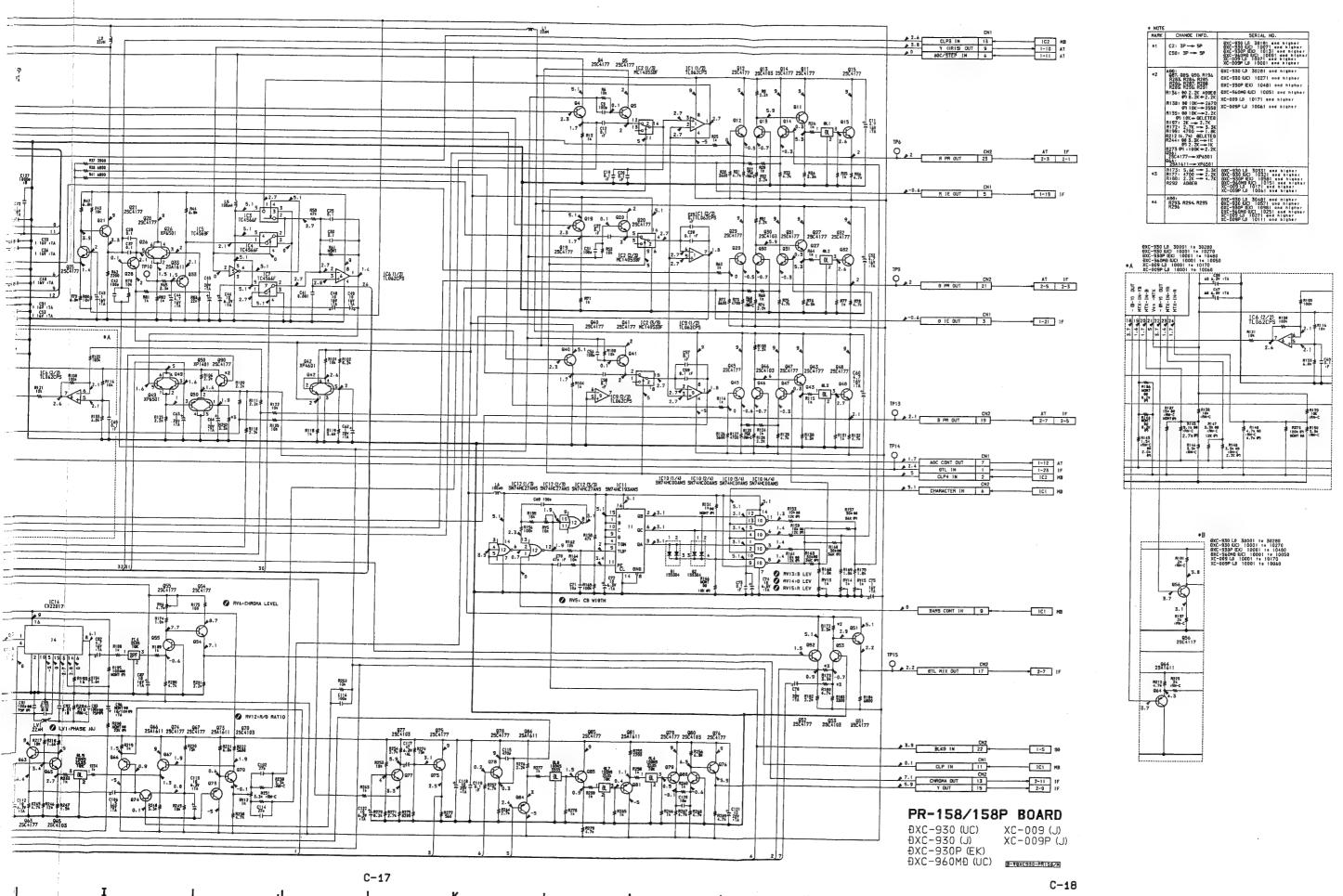


DXC-930/930P DXC-960MD XC-009/009P

## PR-158/158P BOARD

DXC-960MD XC-009/009P





IF-354/354P IF-354/354P

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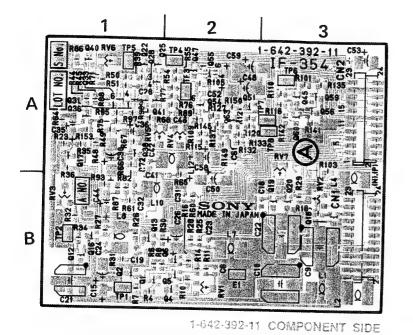
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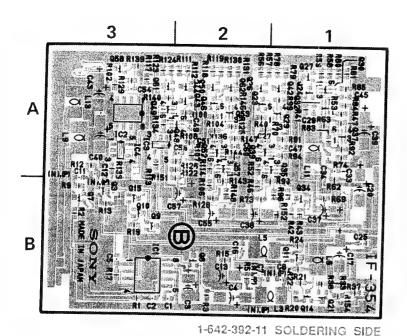
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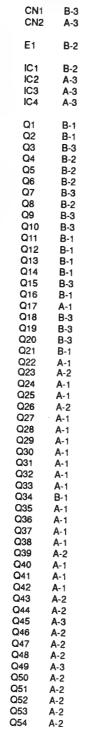
C-20

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Serial No. 30001-30280 DXC-930 (J) 10001-10270 DXC-930 (UC) 10001-10480 DXC-930P (EK) 10001-10050 DXC-960MD (UC) 10001-10170 XC-009 (J) 10001-10060 XC-009P (EK)







IF-354/354P (1-642-392-11)

Q55 Q56 Q57 Q58 Q59

Q60 Q61

Q62

Q63

RV2

RV3

RV4

RV5

RV6

RV7

TP1

TP2 TP3 TP4 TP5 TP6 TP7 TP8

A-3

A-3

A-3

A-3

A-2

A-2

B-2

B-3

B-1

A-2

A-1

A-1

A-3

B-1

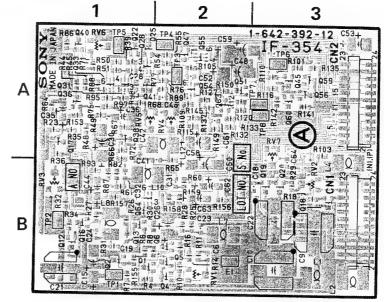
B-1

A-2

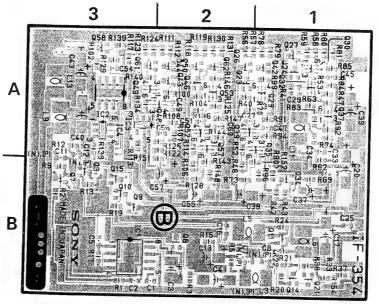
A-2 A-1 A-3 A-3 A-3

IF-354/354P	BOARD	

erial No. 30281-	DXC-930 (J)
10271-	DXC-930 (UC)
10481-	DXC-930P (EK)
50001-	DXC-930P (UC)
10051- 10171- 10061-	XC-009 (J) XC-009 (EK)



1-642-392-12 COMPONENT SIDE



1-642-392-12 SOLDERING SIDE

IF-354/354P (1-642-392-12) B-3 A-3 Q55 Q56 Q57 Q58 Q59 CN2 E1 IC1 IC2 IC3 IC4 A-3 Q62 Q63 Q64 A-3 Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 RV1 RV2 RV3 RV4 B-2 RV5 B-3 RV6 B-2 RV7 B-3 Q10 B-3 TP1 TP2 TP3 TP4 TP5 Q11 Q12 B-1 Q13 B-1 Q14 B-1 B-3 B-1 A-1 B-3 TP6 TP7 TP8 Q15 Q16 Q17 Q18 Q19 Q20 Q21 

A-2 A-3 A-2 A-2 A-3 A-2 A-2 A-2 A-2 A-2

A-3 A-2

A-3 A-3

A-3 A-3 A-2 A-2

B-1

B-2

B-3

B-1

A-2

A-1 A-1

A-3

B-1 B-1

A-2

A-2

A-1

A-3

A-3

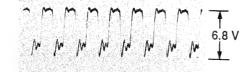
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#### IF-354/354P BOARD

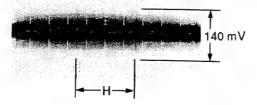
#### NOTE:

- All voltage are DC, measured with a digital voltmeter.
- •DC 電圧はデジタル電圧計による値
- DISPLAY/BARS bottom → "BARS"
- •GAIN :00DB
- •C. TEMP :3200K
- WHT. BAL :AUTO
- R GAIN :+00
- •B GAIN :+00
- •CCD IRIS :OFF
- •SHUTTER :OFF

IF, CN1-10 14MHz



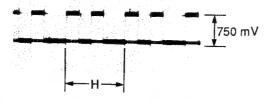
IF, CN1-21 G IE (LENS: CLOSE)



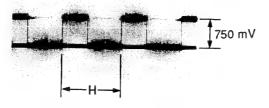
IF, CN1-19 R IE (LENS: CLOSE)



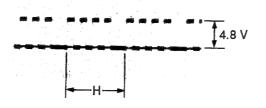
IF, CN2-1 R PR



IF, CN2-3 G PR



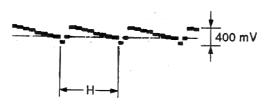
IF, CN2-5 B PR



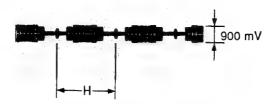
IF, CN2-8 SYNC



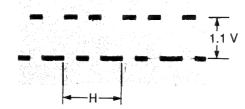
IF, CN2-9 Y



IF, CN2-11 CHROMA



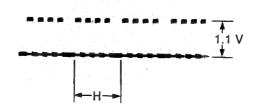
IF, CN2-16 R



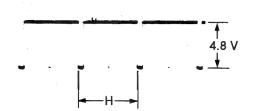
IF, CN2-18 G



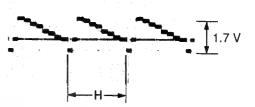
IF, CN2-20 B



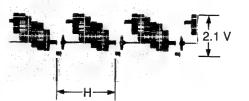
IF, CN2-15 SYNC



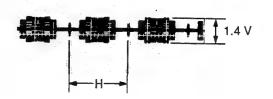
IF, CN2-24 Y



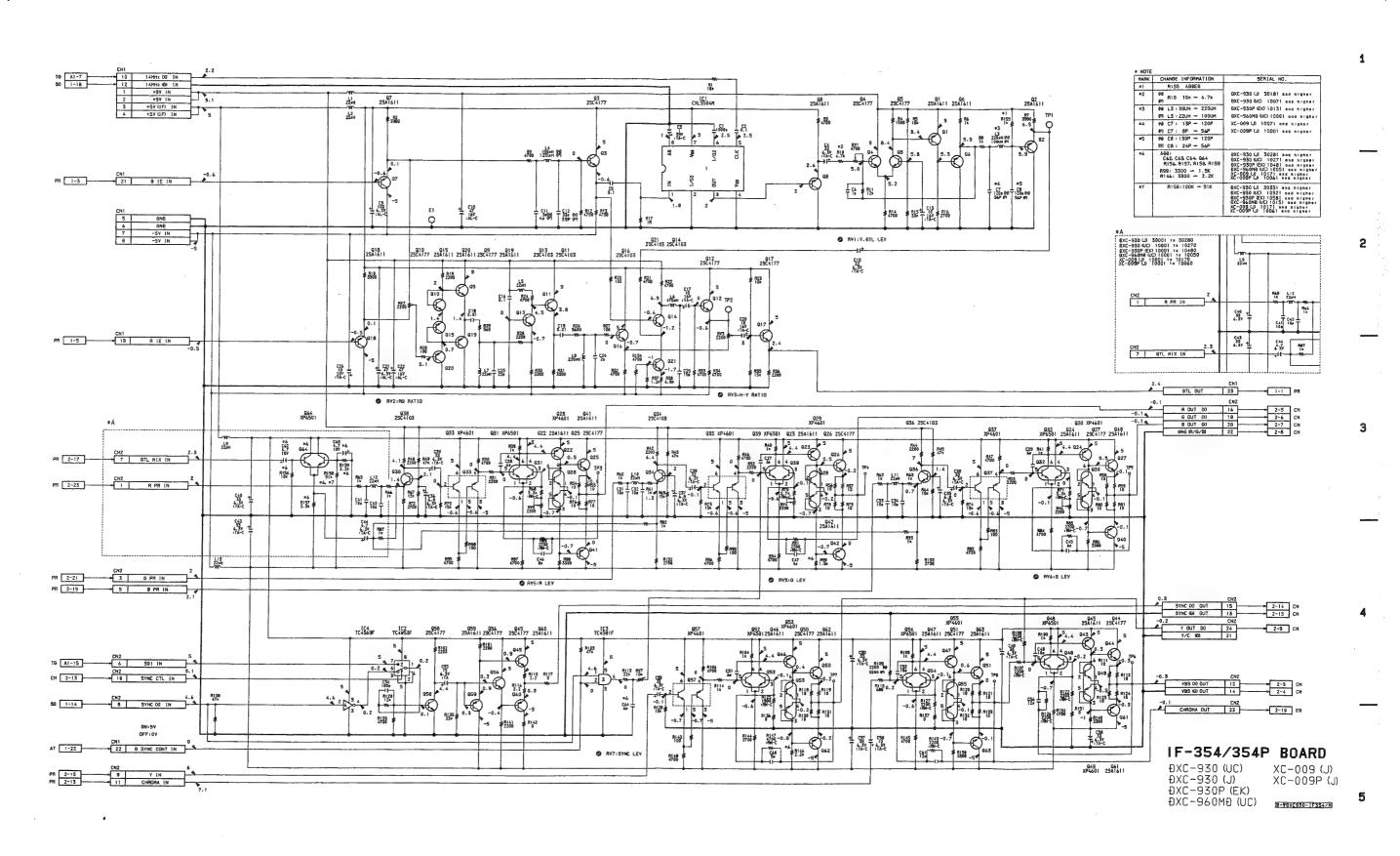
IF, CN2-12 VBS



IF, CN2-23 CHROMA



#### IF-354/354P BOARD



DXC-930/930P DXC-960MD XC-009/009P

C-27

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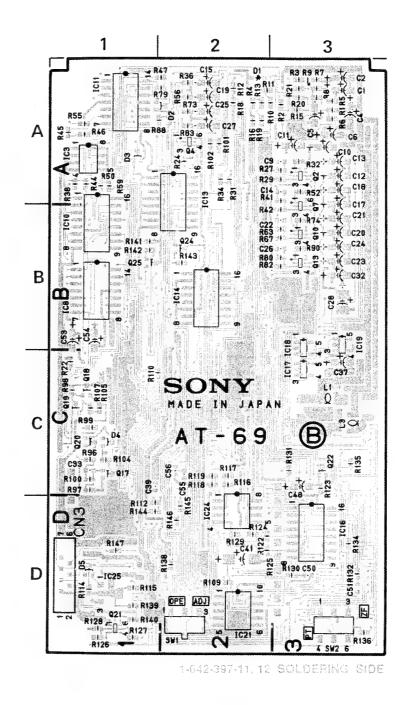
C-58

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# AT-69 BOARD

AT-69 (1	<b>-642-397-11</b> , 1	2)			_	1	
				_	3	2	1
CN1	C-3	RB1	D-3		şarılını deri etti beri etti etti etti etti etti etti etti e		_ 016 C30
CN2	D-3				RIATE	See Case Case Day on	
D1	A-2	SW1	D-2		17 4P - 140 - 120 - 1		2   R6 2   R7 2   R9
D2	A-2 A-1	SW2	D-3		0=+	G See Constitution	2 8 R49 C
D3	A-1	TP3	A-3			Seal - Seal - Cop L	8 R761
D4	C-1	TP4	A-3	A	4-100	PRINCIPAL CONTROL CONT	<b>3</b> ( 1 )+
D5	D-1	TP5	B-3				S 865
<b>-</b> .		TP6	B-3		05	SA BOO REMARKS AND	© 75 R75 N
E1 E2	C-3 D-1	X1	C-1		R43		The second second
EZ	D-1	X1	C-1	<u> </u>	1 % A R53		vi R61 11 -
IC1	A-3			TP	R71	3 3	R68 1
IC2	A-2				RE4 11		
IC3	A-1					A10 . (1864 Exchange)	3-42
IC5 IC7	A-1 A-1					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	119 37
	A-1 B-1			I		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3
	B-3				. L 8	1995 - 1927 1996 - 1996	R33
IC10	B-1			B D	Re7		
	A-1			15	15		R25
	B-1			1 1		The second of th	
	A-1 B-2			lω	13	SON	
	B-2			397		MARCIN	TADAN
	D-3				[8]	MADELIN	AAFAN A
	C-3					AT-69_	022
	B-3			ि	i E	CAO	on C35
	B-3 D-1			Ž		1 2 to 1	
IC21	D-2			喊	<b></b>	S THING	C36
IC22	C-1					: 0	)+(
IC23	C-2			C	A A	10. 8 Ls	, f
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Q1	C-1			23			
	A-3			African Copen			少意
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	A-2 A-3			RIS N P		A CONTRACTOR OF THE CONTRACTOR	
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Q7 .	B-3			2 juga - 4		The state of the s	₹C43
Q8 .	A-3					BANK COMMENT OF THE PROPERTY O	- C10000
Q9	B-3			10 m		1850 mm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- FR
Q10 Q11	B-3 B-3			D		WOODS - p /S   manual m	C2
	в-з В-3					2000 To 1000 T	Minute Tall
Q13	B-3				3	32	Rizo
Q14 i	B-3			12		關於 医阿拉萨马奇氏学医马氏手续	99933 T. HILL
	A-1			IN:	If a Himmon James		
	A-1 C-1			" Ri	The second section of the section of the section of the second section of the section		To Comment of the Com
	0-1 0-1					4 C 4 C C C C C C C C C C C C C C C C C	h ship of the last is a some in the
219 (	C-1					1-642-397-11, 12 (	JUNIPONENT
220 (	C-1						
Q21 [	D-1						
	C-3 C-3						
	3-2						
	3-1						



AT-69 (1-642-397-11, 12)						
CN1 CN2	C-3 D-3		RB1	D-3		
D1 D2 D3 D4 D5	A-2 A-1 A-1 C-1 D-1		SW1 SW2 TP3 TP4 TP5	D-2 D-3 A-3 A-3 B-3		
E1 E2	C-3 D-1		TP6 X1	B-3 C-1		
IC1 IC2 IC3 IC5 IC7 IC8 IC9 IC10 IC11 IC12 IC13 IC14 IC15 IC16 IC17 IC18 IC19 IC20 IC21 IC22 IC23 IC24 IC25	A-3 A-2 A-1 A-1 B-1 B-1 B-1 B-1 B-2 D-3 C-3 B-3 D-2 C-1 C-2 D-1					
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25	C-1 A-3 A-3 A-2 A-3 B-3 B-3 B-3 B-3 B-3 B-3 C-1 C-1 C-1 C-1 D-1 C-3 D-3 B-2 B-1					

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DXC-930/930P DXC-960M0 XC-009/009P

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#### AT-69 BOARD

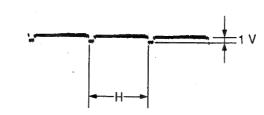
#### NOTE:

- All voltage are DC, measured with a digital voltmeter.
- •DC 電圧はデジタル電圧計による値
- DISPLAY/BARS bottom → "BARS"
- •GAIN :00DB
- C. TEMP :3200K
- WHT. BAL :AUTO
- R GAIN :+00
- •B GAIN :+00
- •CCD IRIS :OFF
- SHUTTER :OFF

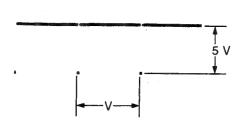
AT, CN2-5 G PR



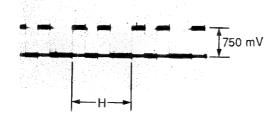
AT, CN1-10 Y (IRIS)



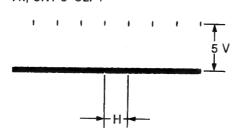
AT, CN2-2 VD



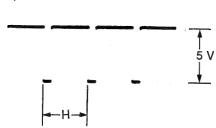
AT, CN2-3 R PR



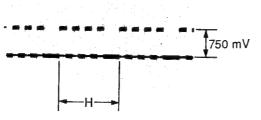
AT, CN1-8 CLP1



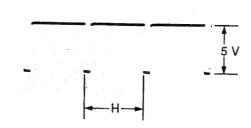
AT, CN2-1 BLKG



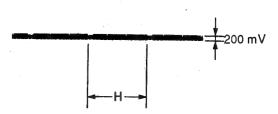
AT, CN2-7 B PR



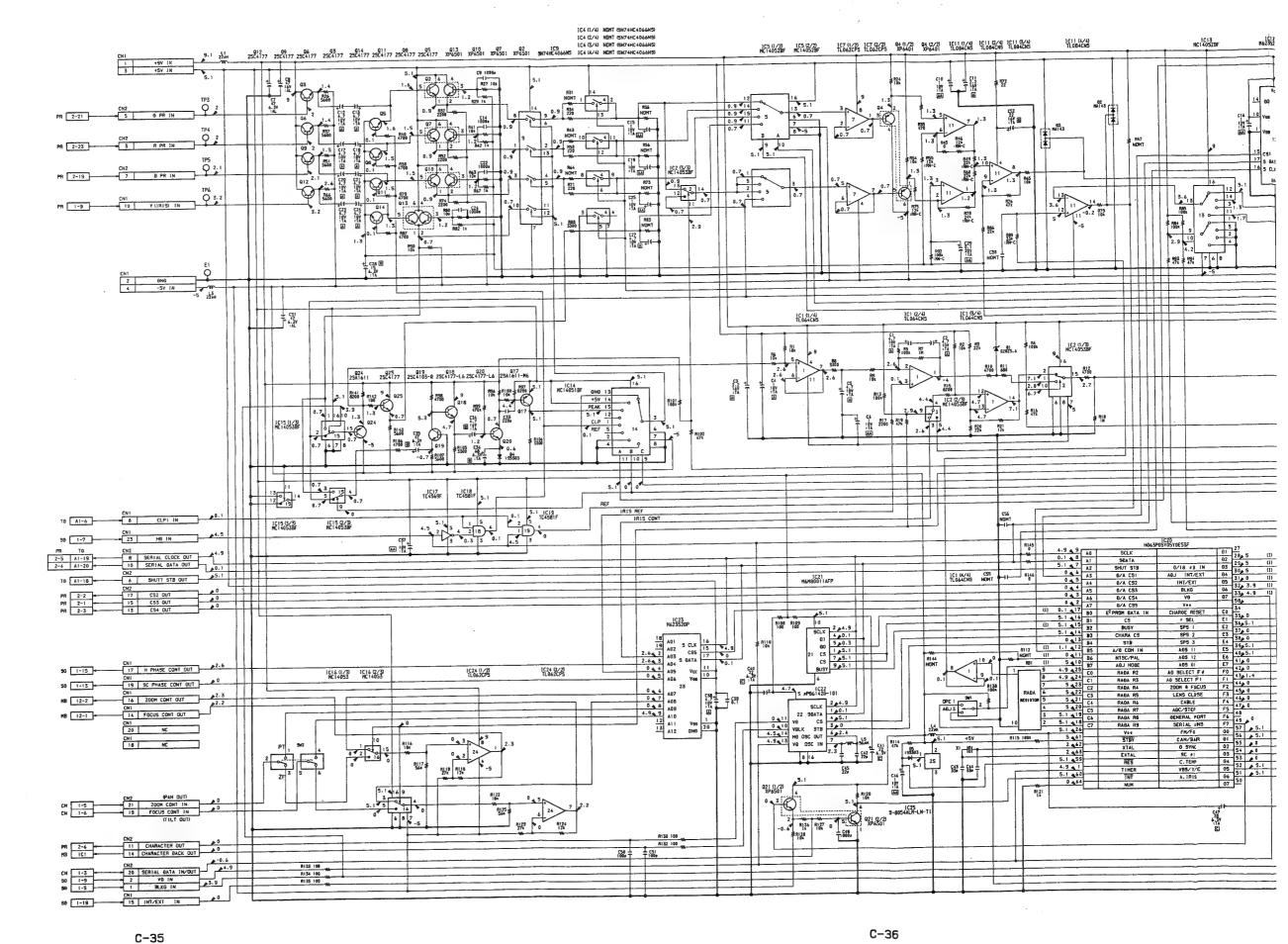
AT, CN1-23 HD



AT, CN1-13 REF PULSE



AT-69 BOARD



DXC-930/930P DXC-960MD XC-009/009P

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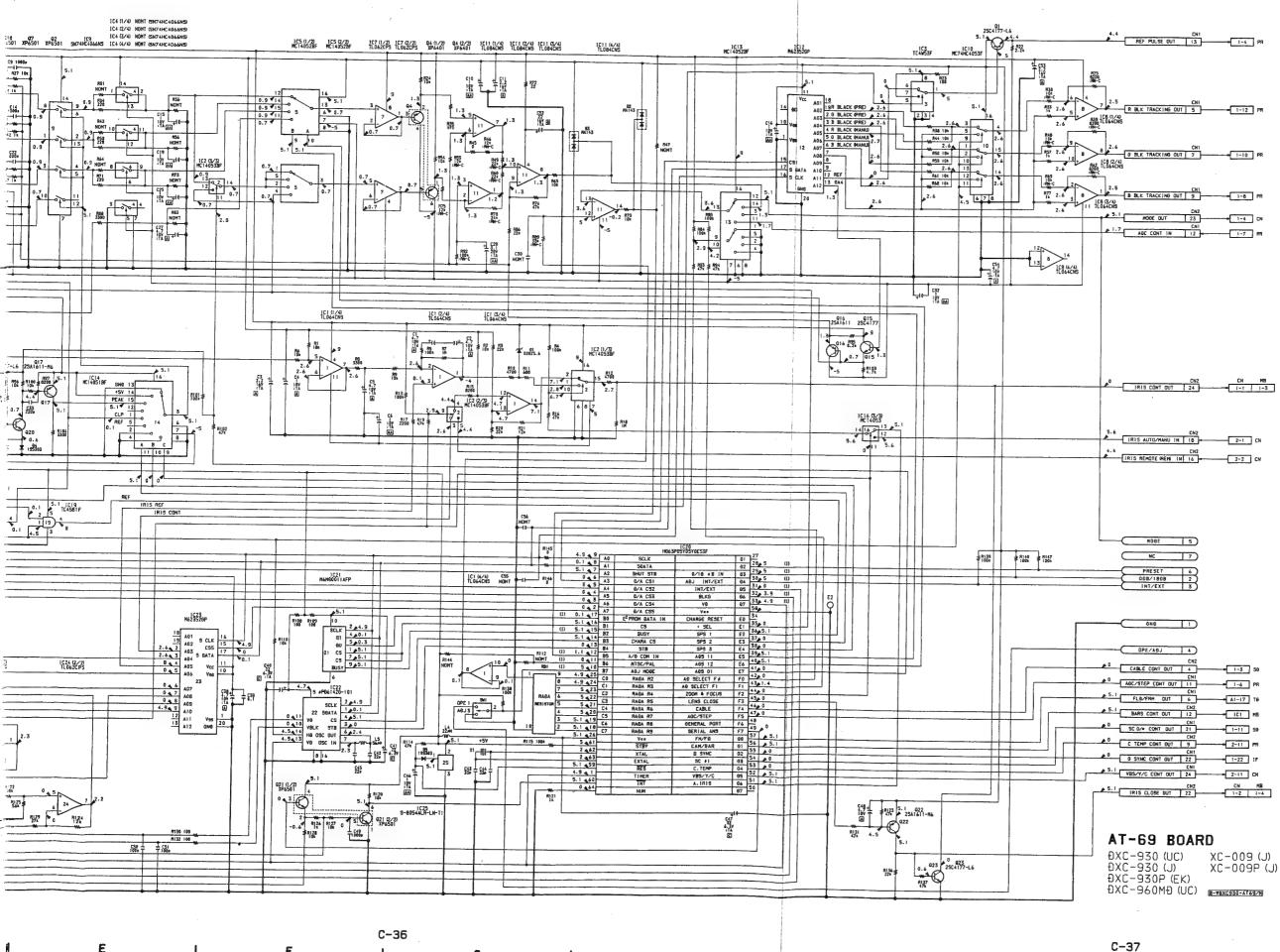
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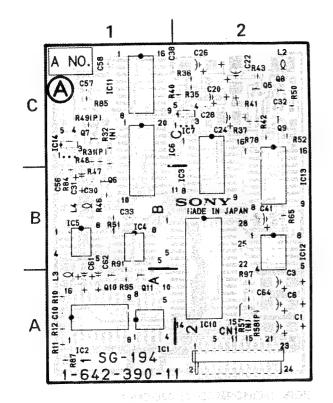


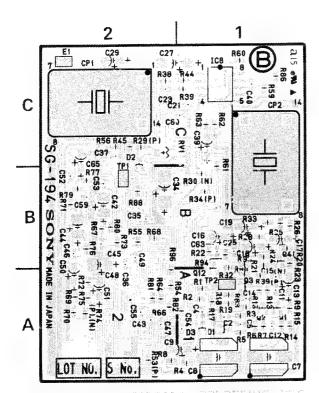
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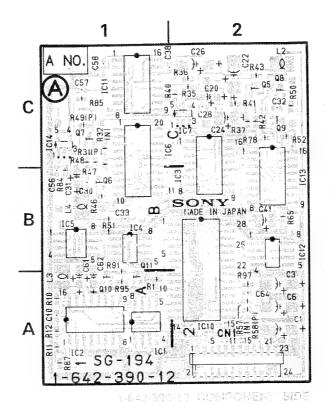
Serial No. 30001-30230 DXC-930 (J) 10001-10170 DXC-930 (UC) 10001-10380 DXC-930P (EK) 10001-10050 DXC-960MD (UC) 10001-10170 XC-009 (J) 10001-10060 XC-009P (EK)

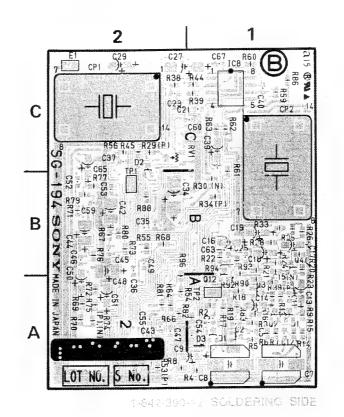




SG-194	/194P (1-642-390-11	1)
CN1	A-2	
CP1 CP2	C-2 C-1	
D1 D2 D3	A-1 C-2 A-1	
E1	C-2	
IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8 IC10 IC11 IC12 IC13 IC14	A-1 C-2 B-1 B-1 C-1 C-2 C-1 A-1 C-1 B-2 B-2 C-1	
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12	A-1 A-1 B-1 C-2 B-1 C-1 C-2 C-2 A-1 A-1	
RV1	C-1	
TP1 TP2	B-2 A-1	

# SG-194/194P BOARD





# SG-194/194P (1-642-390-12)

Serial No. 30231-30480 DXC-930 (J) 10171-10570 DXC-930 (UC) 10381-10980 DXC-930P (EK) 10051-10250 DXC-960MD (UC) 10171-10320 XC-009 (J) 10061-10110 XC-009P (EK)

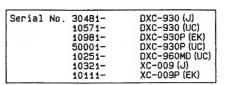
CP1 C-1 CP2 C-1 CP2 A-1	2 1 1 2
P2 C-	1 1 2
)1 A-	2
)2 C- )3 A-	1
1 C-	2
C1 A- C2 A- C3 C- C4 B- C5 B- C6 C- C7 C- C8 C- C10 A- C11 C- C12 B- C13 B- C14 C-	1 2 1 1 1 2 2 1 1 1 2 2
Q1 A- Q2 A- Q3 A- Q4 B- Q5 C- Q6 B- Q7 C- Q8 C- Q9 C- Q10 A- Q11 A- Q12 A-	-1 -1 -1 -2 -1 -1 -2 -2 -1
RV1 C	-1
TP1 C TP2 A	-2 -1

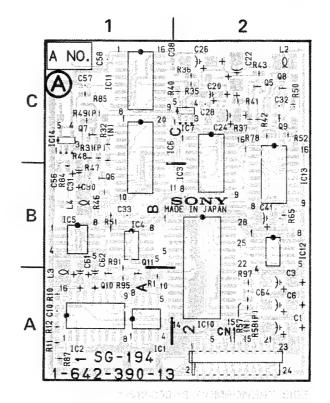
C-38

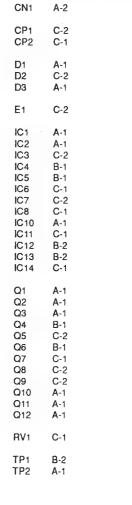
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SG-194/194P

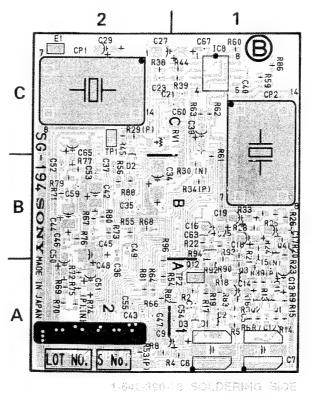
SG-194/194P BOARD







SG-194/194P (1-642-390-13)



DXC-930/93OP DXC-960MD XC-009/00\$P

C-40

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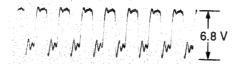
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#### SG-194/194P BOARD

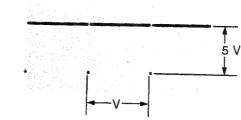
#### NOTE:

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- DISPLAY/BARS bottom → "BARS"
- •GAIN :00DB
- C. TEMP :3200K
- WHT. BAL :AUTO
- •R GAIN :+00
- •B GAIN :+00
- •CCD IRIS :OFF
- •SHUTTER :OFF

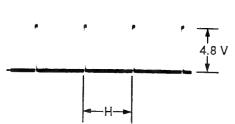
SG, CN1-20 14MHz



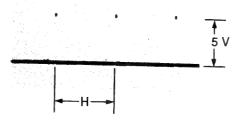
SG, CN1-9 VD



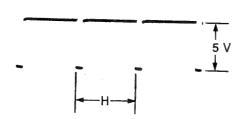
SG, CN1-8 BF



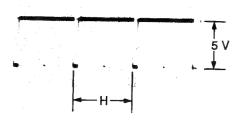
SG, CN1-16 CLP (AGC)



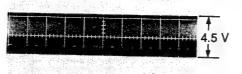
SG, CN1-7 HD



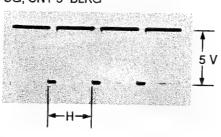
SG, CN1-14 SYNC



SG, CN1-17 28MHz



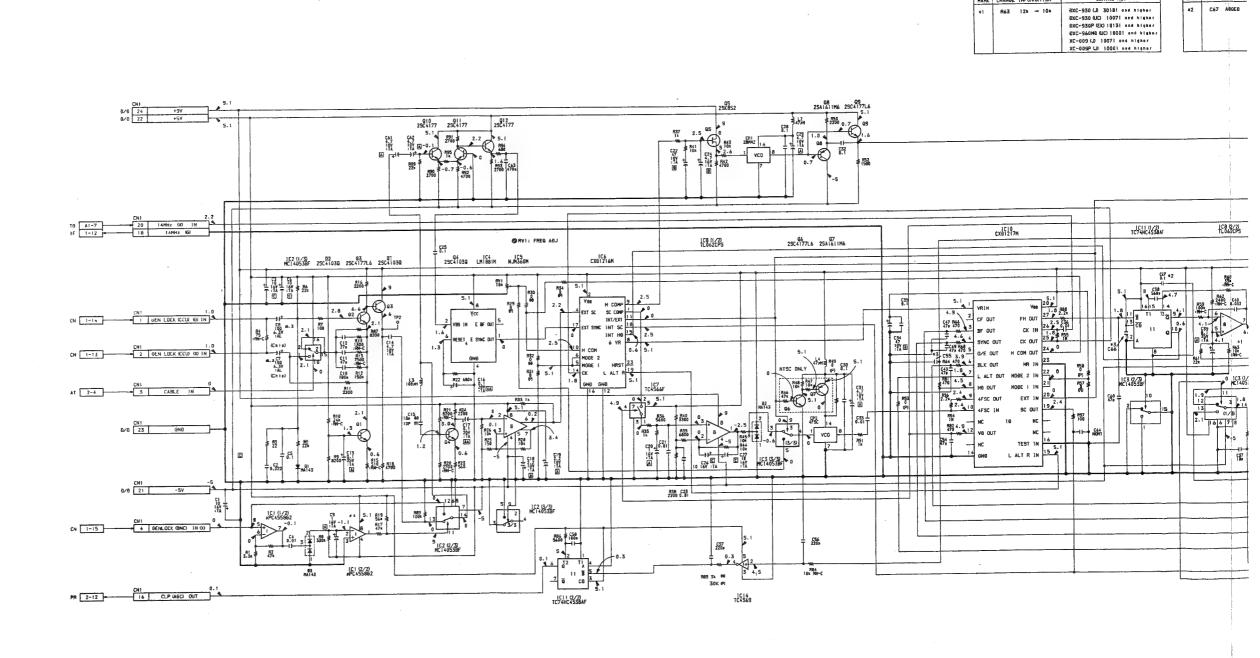
SG, CN1-5 BLKG



SG, CN1-12 SC

WWW.

SG-194/194P BOARD



DXC-930/930P DXC-960MD XC-009/009P

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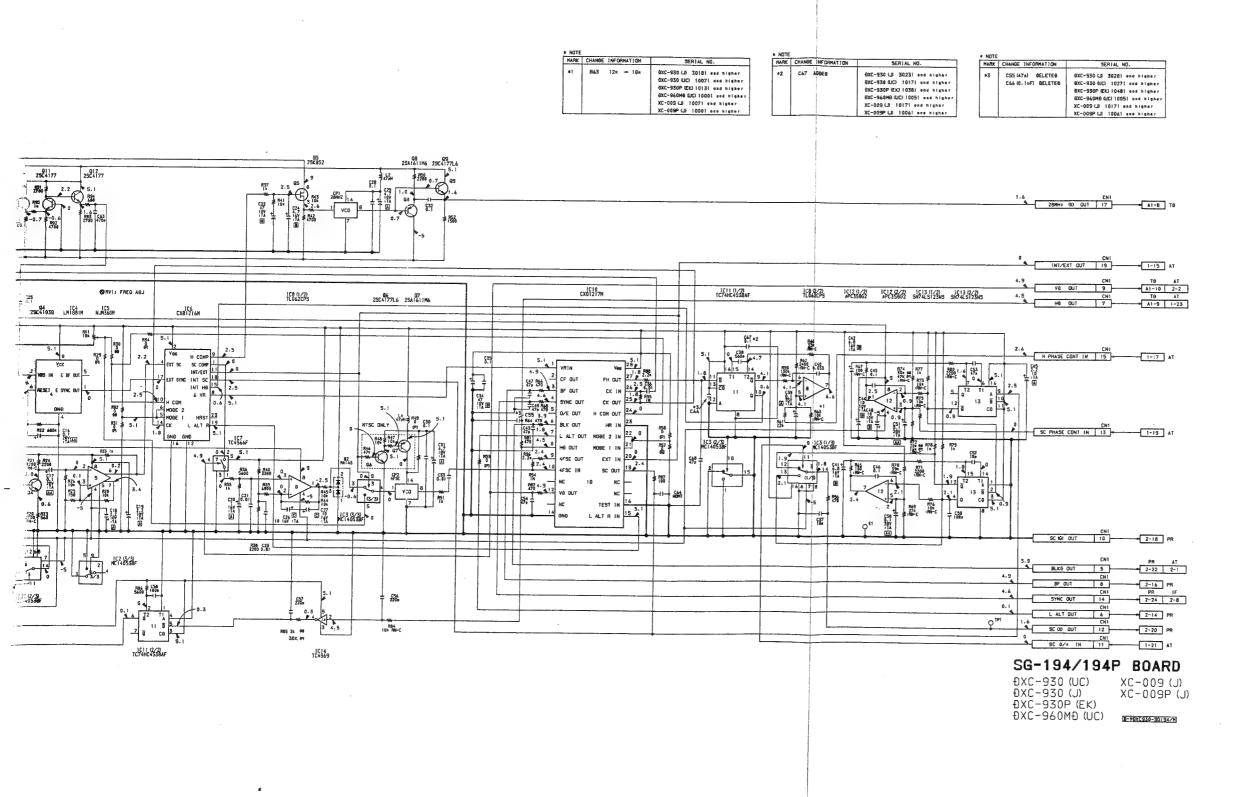
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C-46

C-47

# PA-133 BOARD

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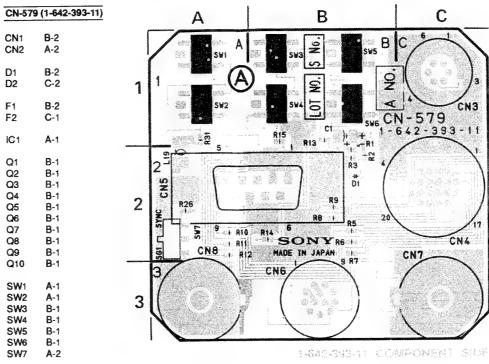
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PA-133 (1-642-388-11, 12)		A	В	
IC2	A-1	PA	-133 1-642-388-11	
IC3	A-1		T NO. 5 No.   C13	
IC4 Q1	B-1 A-1	122 O A <sub>1C1</sub>	t ( SONY	
Q2	A-1	1 + ( CII ) + T	+ 4	
		1   C12   8 ± + 8 ÷	_+   C15 <sub>+</sub> C16	
		A NO.	HADE IN JAPAN	
		R3   C7+ 2-+ 1	+ +	
		ALL STREET, STATE OF STATE OF STREET, STATE OF STATE OF STREET, STATE OF STATE O	A recovery on the State of the State of	

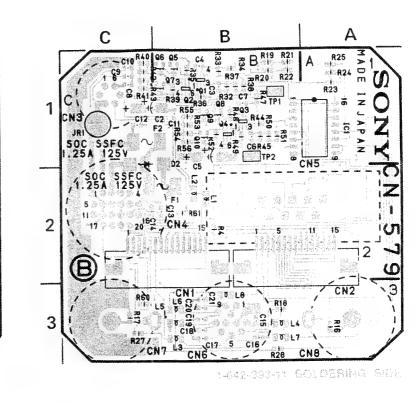
		10.50	arone: T	SID
	В		Α	
	- B	R9 PA	-133 🖫	3-1
200	5		R8	5
	CI ·			5

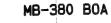
1-842-388-TI 12 SOLDERING SIDE

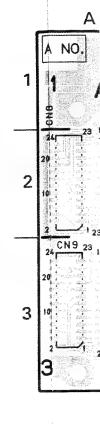
# CN-579 BOARD



Serial No.



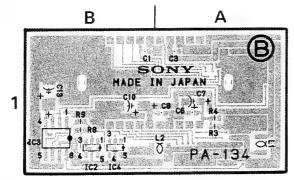




#### PA-134 BOARD

PA-13	4 (1-642-389-11, 12)	Α	В
IC2 IC3 IC4	B-1 B-1 B-1	22 10 C5	<b>A</b> _
Q1 Q2	B-1 A-1	1 N ON W	62 61 1 (C) +
		ON 20 15 10 16 1	), C1220 PA-134 + 1-542-389-11

1-642-389-11, 12 COMPONENT SIDE



1-642-389-11, 12 SOLDERING SIDE

C-48 (a)

# CN-580 BOARD

A-2

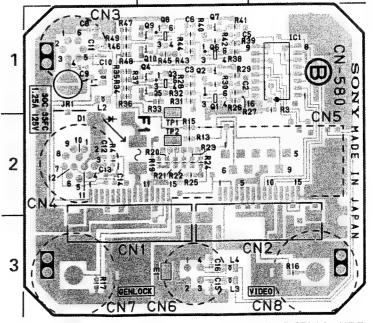
B-1

B-1

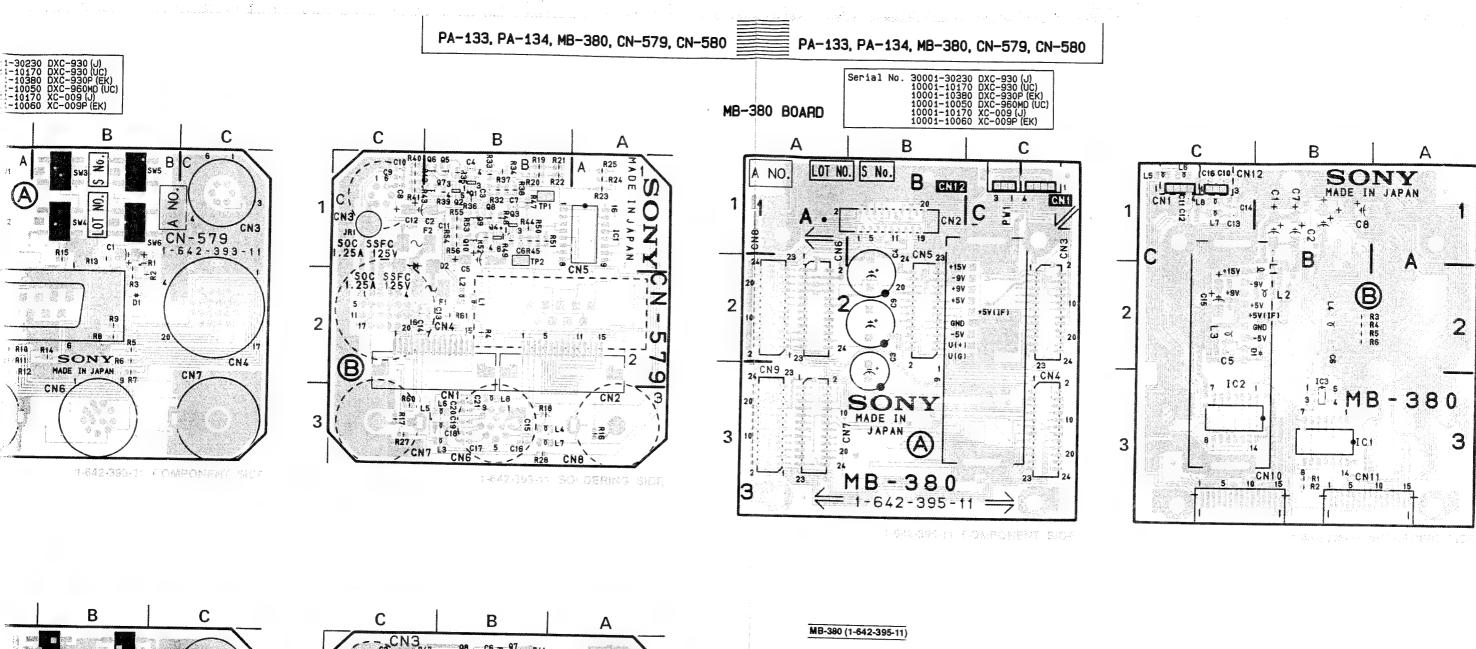
TP1

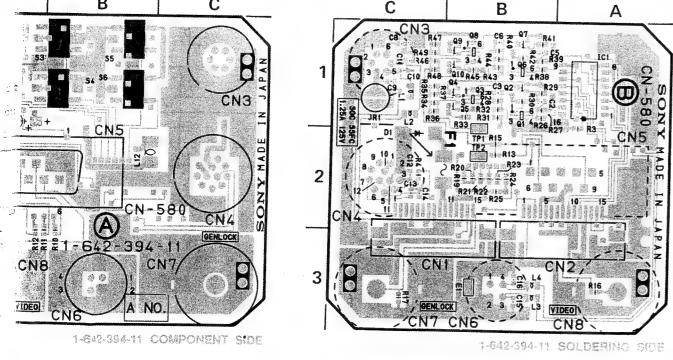
TP2

CN-58	80 (1-642-394-11)		Α	В	С
CN1 CN2	C-2 A-2				
D1	C-1	500 m			
F1	B-2	1 80° 10° 10° 10° 10° 10° 10° 10° 10° 10° 1	The same of the sa	54 56	
IC1	A-1	2	7257 (20)		CN3 Z
Q1	B-1		* )+ <u>*</u> +	+ 1 CN5	
Q2	B-1		T = 15 T-	12 505 1 GRAND	w
Q3	B-1	鑑	N g N L		A D E
Q4	B-1				
Q5	B-1	2			REPORTED AND AND AND AND AND ADDRESS OF THE PARTY ADDRESS OF THE PART
Q6	B-1	-1 1			
Q7	B-1	O		Table 100 Control of the Control of	\ / Z
Q8	B-1	SYNC	9 9	CN-	580 CN4 0
Q9	B-1 B-1		1	A	CN4
Q10	<b>B</b> -1		75	A Comment	GENLOCK
S1	A-1	SGI		1 642-394	11
S2	A-1		MANAGEMENT AND THE STATE OF THE	SEL SERVICE AND ALL PROPERTY OF THE PARTY OF	NIZ A
S3	B-1	3 /	] \C\		N7/ _ D\
S4	B-1	3 //			
S5	B-1			3\	-1
S6	B-1	1	VIDE		10.1
<b>S</b> 7	A-2		THE THE PROPERTY OF THE PARTY O	CN6	
TP1	B-1			1-842-394-11	COMPONENT SIDE
TP2	B-2				

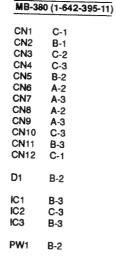


1-642-394-11 SOLDERING SIDE





C-49 (a)



DXC-930/930P DXC-960MD XC-009/009P



MB-380 BOAF

A NO.



CN-579 (1-642-393-12)

B-2 A-2

B-2 C-2 B-2

C-1 A-1

B-1 B-1 B-1 B-1 B-1 B-1

B-1 B-1 B-1 B-1

A-1 B-1 B-1 B-1

B-1

A-2

B-1

CN1 CN2

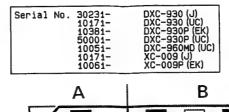
D1 D2

F2

Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10

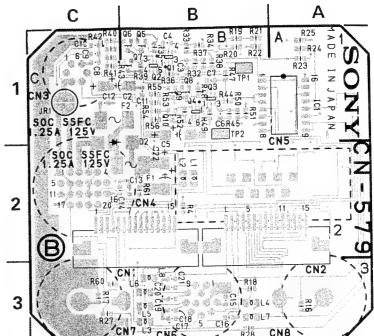
SW1 SW2 SW3 SW4 SW5 SW6 SW7

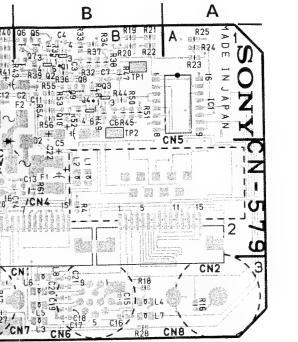
TP1 TP2



**3 2 3** 

CN8 - RIZ MADE IN JAPAN





3

2

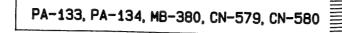
5

C

1-642-393-12 COMPONENT SIDE

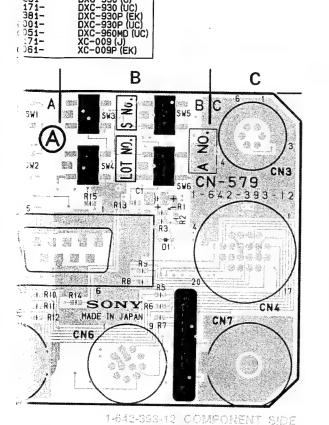
C-48 (b)

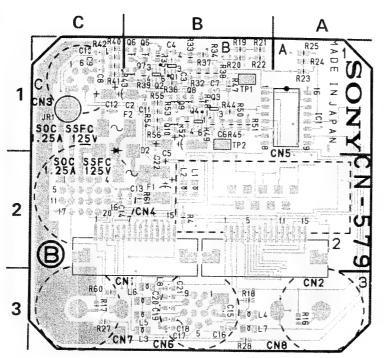
C-49 (b)

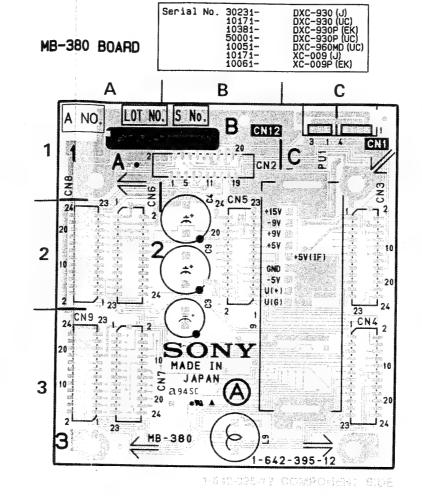


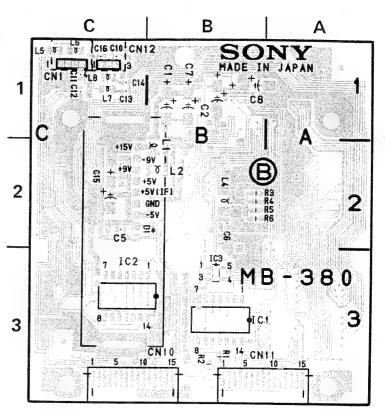
PA-133, PA-134, MB-380, CN-579, CN-580

Serial No.







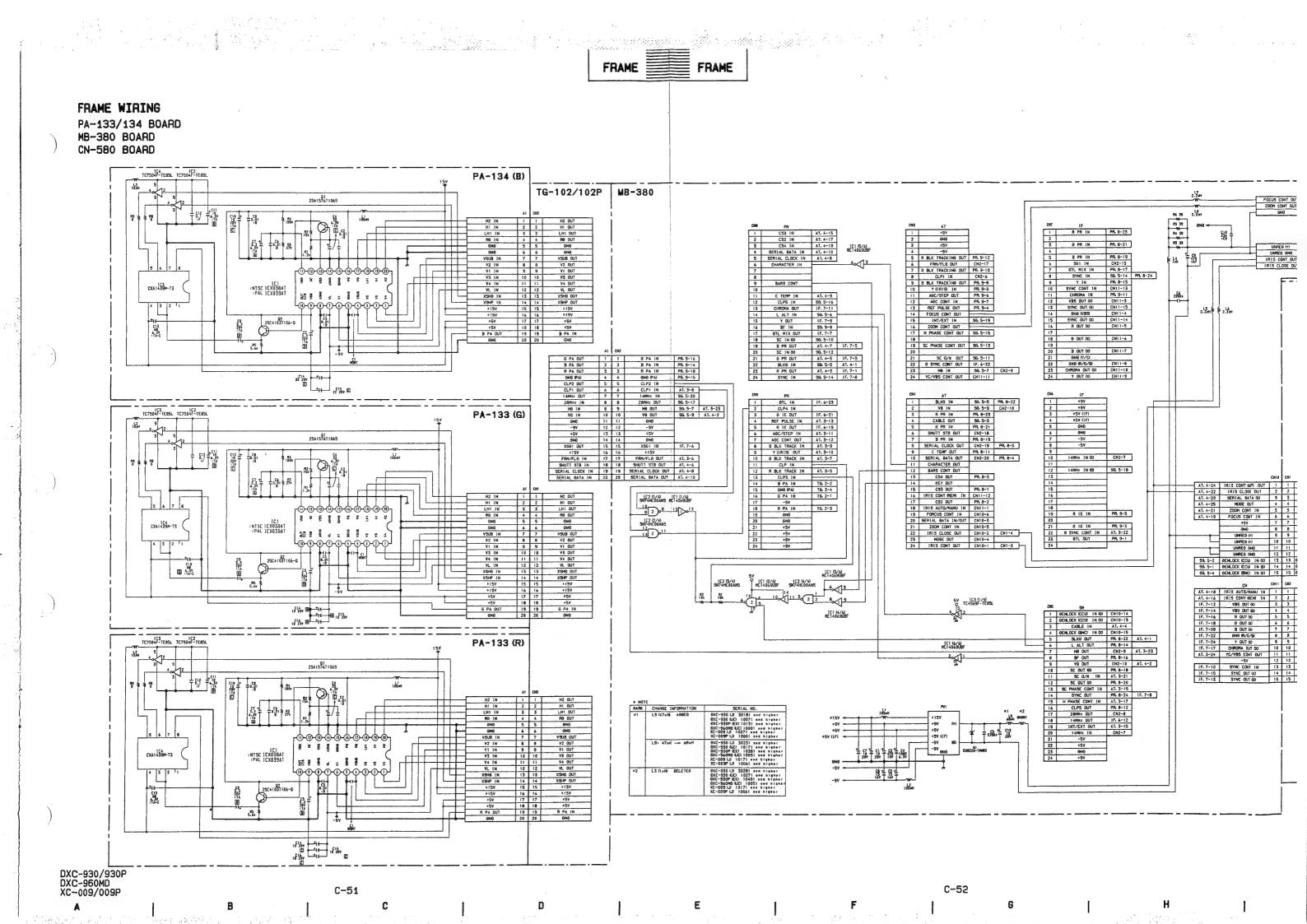


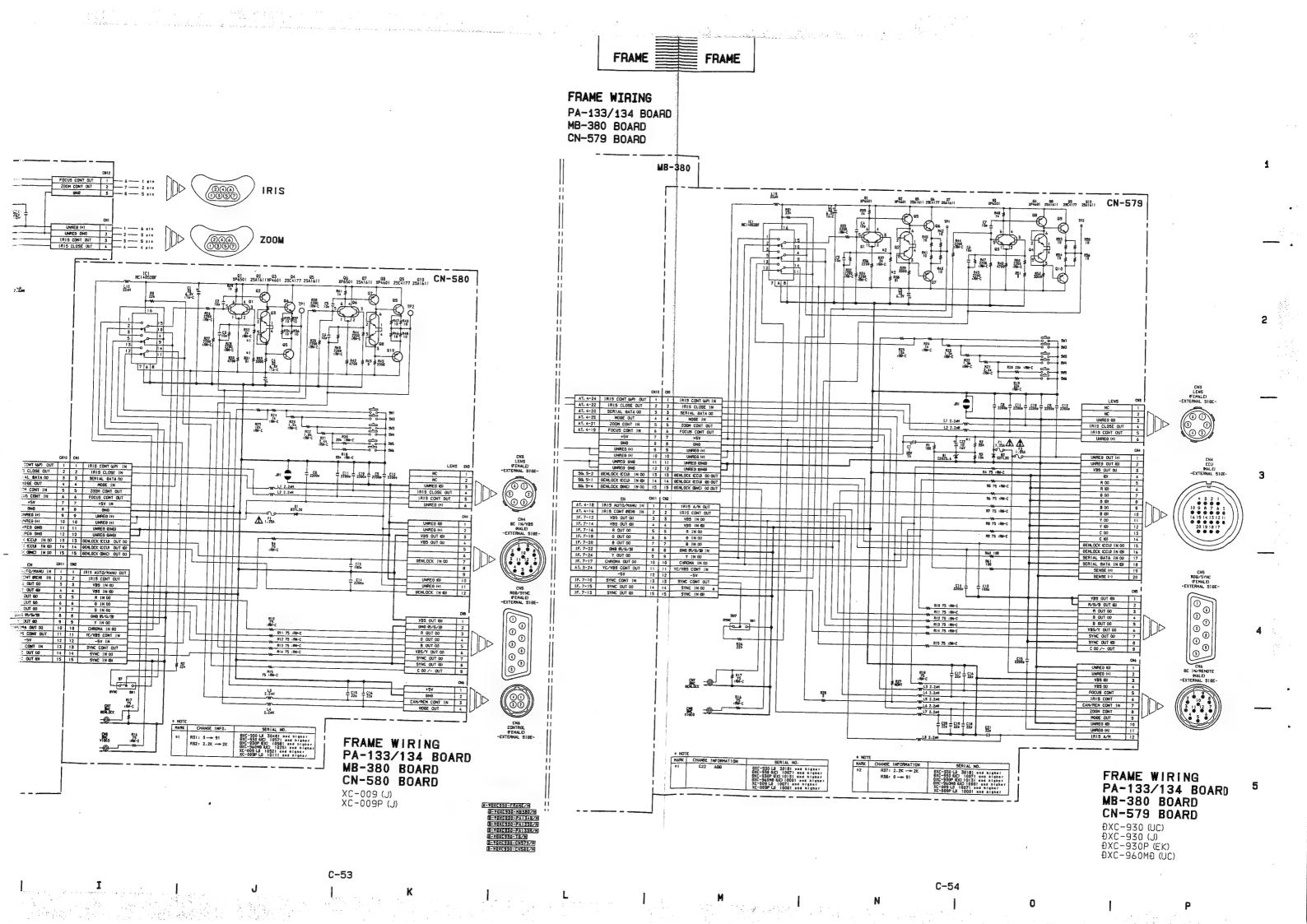
MB-380 (1-642-395-12) CN1 CN2 CN3 CN4 CN5 CN6 CN7 CN8 CN9 CN10 CN11 CN12 C-1 B-1 C-2 C-3 B-2 A-2 A-3 C-3 B-3 C-1 D1 B-2 IC1 IC2 IC3 B-3 C-3 B-3 PW1 B-2

C-49 (b)

C-50 (b)

DXC-930/9 30P DXC-960MD XC-009/00 9P L





# SECTION D SPARE PARTS

#### PARTS INFORMATION

#### 1. Safety Related Component Warning

Components identified by shading marked with  $\triangle$  on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

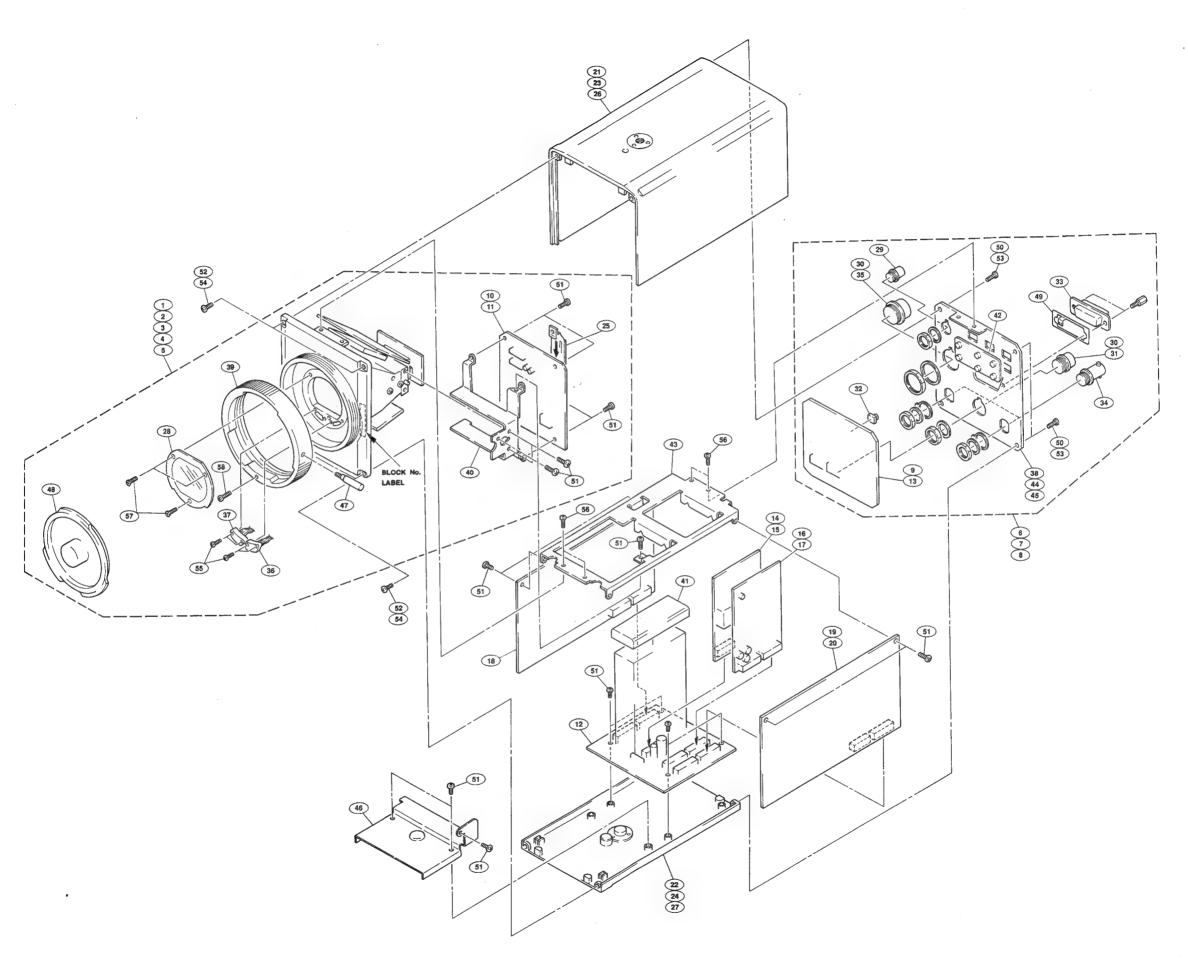
2. Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."

• This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present."

- Regarding engineering parts and diagrams changes in our engineering department, refer to Sony service bulletins and service manual supplements.
- 3. The parts maked with "S" in the SP column of the exploded views and electical spare parts list are nomally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.
- 4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.
- All capacitors are in micro farads unless otherwise specified.
   All inductors are in micro henried unless otherwise specified.
   All resistors are in ohms.

#### EXPLODED VIEW

```
No.
        Part No.
                       SP Description
        A-7575-196-A s CCD UNIT-C930 (N) (DXC-930)
                                                                                   1-949-642-11 o HARNESS (ZOOM)
        A-7575-197-A s CCD UNIT-C930P(P) (DXC-930P) +2
                                                                                   1-949-643-11 o HARNESS (IRIS)
                                                                           37
                                                                                   3-174-661-01 o PANEL (COMPO), REAR (XC-009/009P)
3-174-668-01 o RING, MOUNT
        A-7575-198-A s CCD UNIT-009(N) (XC-009)
                                                           +3
                                                                           38
  3
        A-7575-203-A s CCD UNIT-C930 (N) (DXC-960MD) *4
                                                                           39
                                                                                   3-174-669-02 o BRACKET, TG
        A-7575-204-A s CCD UNIT-009P(P)(XC-009P)
                                                                           40
  5
        A-8262-277-A o PANEL ASSY, REAR (XC-009/009P)
A-8262-282-A o PANEL ASSY, REAR (DXC-930/930P)
A-8262-486-A o PANEL ASSY, REAR (DXC-960MD)
  6
                                                                           41
                                                                                   3-174-670-01 s RUBBER, HEAT ELECTRIC
                                                                           42
                                                                                   3-174-672-01 o SHEET, REAR
                                                                           43
                                                                                   3-174-673-02 o STAY
                                                                                   3-174-674-01 o PANEL (INST), REAR (DXC-930/930P)
3-174-674-11 o PANEL (INST), REAR (DXC-960MD)
  9
        A-8271-134-A o MOUNTED CIRCUIT BOARD, CN-580
                                                                           44
                                                     (XC-009/009P)
                                                                           45
         A-8271-135-A o MOUNTED CIRCUIT BOARD, TG-102
10
                                         (DXC-930/960MD, XC-009)
                                                                           46
                                                                                   3-176-677-01 o PLATE, SHIELD
                                                                                                            (DXC-930/930P/960MD, XC-009P)
         A-8271-137-A o MOUNTED CIRCUIT BOARD, TG-102P
                                                                           47
                                                                                   3-678-629-00 s LEVER, MOUNT
11
                                                                                   3-699-144-01 s CAP, MOUNT
3-737-536-01 o LUG, GROUND, CONNECTOR
                                             (DXC-930P, XC-009P)
                                                                           48
        A-8271-139-A o MOUNTED CIRCUIT BOARD, MB-380
A-8271-140-A o MOUNTED CIRCUIT BOARD, CN-579
12
                                                                           49
                                                                                   7-621-770-67 s SCREW +B 2.6X6
13
                                                                           50
                                             (DXC-930/930P/960MD)
        A-8271-141-A o MOUNTED CIRCUIT BOARD, SG-194
                                                                           51
14
                                                                                   7-621-772-18 s SCREW +B
                                         (DXC-930/960MD, XC-009)
                                                                                   7-621-773-87 s SCREW +B 2.6X10
                                                                           52
15
         A-8271-142-A o MOUNTED CIRCUIT BOARD, SG-194P
                                                                           53
                                                                                   7-621-773-95 s SCREW +B 2.6X6 (XC-009/009P)
                                              (DXC-930P, XC-009P)
                                                                                   7-621-775-50 s SCREW +B 2,6X10 (XC-009/009P)
                                                                           54
                                                                           55
                                                                                   7-627-450-98 s SCREW, PRECISION +K 1.7X5 TYPE1
        A-8271-143-A o MOUNTED CIRCUIT BOARD, IF-354
18
                                                                                   7-627-452-27 s SCREW, +K 2X4
7-627-452-28 s SCREW, PRECISION +K 2X4
                                         (DXC-930/960MD, XC-009)
                                                                           56
17
        A-8271-144-A o MOUNTED CIRCUIT BOARD, IF-354P
                                                                           57
                                              (DXC-930P, XC-009P)
                                                                           58
                                                                                   7-627-552-58 s SCREW, PRECISION +P 1.7X5
         A-8271-145-A o MOUNTED CIRCUIT BOARD, AT-69
18
        A-8271-146-A o MOUNTED CIRCUIT BOARD, PR-158
19
                                                                           *1
                                                                                   CCD BLOCK NUMBER; V A XXXXX N
                                         (DXC-930/960MD, XC-009)
                                                                                   CCD BLOCK NUMBER; V A XXXXX P
20
         A-8271-147-A o MOUNTED CIRCUIT BOARD: PR-158P
                                                                           *2
                                             (DXC-930P, XC-009P)
                                                                           *3
                                                                                   CCD BLOCK NUMBER: CCA XXXXX
                                                                                   CCD BLOCK NUMBER; CGA XXXXX
                                                                           *4
        X-3166-543-3 o CASE ASSY (COMPO), UPPER (XC-009/009P)
X-3166-544-2 o CASE ASSY (COMPO), LOWER (XC-009/009P)
21
                                                                                   CCD BLOCK NUMBER: CDA XXXXX
22
        X-3166-546-3 o CASE ASSY (INST), UPPER (DXC-930/930P)
X-3166-547-2 o CASE ASSY (INST), LOWER (DXC-930/930P)
23
24
                                                                           How to read the CCD BLOCK NUMBER
25
        X-3166-548-1 o SPRING ASSY, TG RADIATION
                                                                                 V A XXXXX N
        X\text{-}3166\text{-}701\text{-}2 o CASE ASSY (MD), UPPER (DXC-960MD) X\text{-}3166\text{-}702\text{-}1 o CASE ASSY (MD), LOWER (DXC-960MD) 1\text{-}547\text{-}463\text{-}11 o Filter Unit, OPTICAL
27
                                                                                                      -N; NTSC, P; PAL
28
                                                                                               -Block number of CCD UNIT
        1-562-222-21 s CONNECTOR, 6P FEMALE "LENS"
29
                                                                                          Suffix of Spare Part number
30
        1-562-381-00 s CONNECTOR, 12P MALE
                              "DC IN/REMOTE" (DXC-930/930P/960MD)
                                                                                    -Block No.
                                          "DC IN/VBS" (XC-009/009P)
                                                                                 C C A XXXXX
31
        1-563-929-11 s CONNECTOR, 4P FEMALE "CONTROL"
                                                        (XC-009/009P)
                                                                                                     -Block number of CCD UNIT
        1-571-787-11 s SWITCH, TACTILE "MENU" "DISPLAY
32
                                                                                             Suffix of spare part number
        1-580-090-11 s CONNECTOR, D-SUB 9P "RGB/SYNC"
33
        1-580-724-21 s CONNECTOR, BNC "VIDEO OUT" "GENLOCK"
                                                                                         Model name
34
35
        1-691-629-11 s CONNECTOR, 20P MALE "CCU"
                                                                                          (C: XC-009 G:DXC-960MD D: XC-009P)
                                               (DXC-930/930P/960MD)
                                                                                     CCD type
```



DXC-930/930F DXC-960MD XC-009/009P

#### SUPPLIED ACCESSORIES

Ref. No.

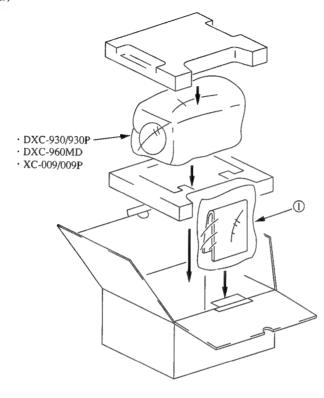
or Q'ty Part No. SP Description

3-754-756-03 s MANUAL, INSTRUCTION (XC-009/009P)

⚠ 3-754-789-13 s MANUAL, INSTRUCTION (DXC-930/930P)

⚠ 3-755-152-12 s MANUAL, INSTRUCTION (DXC-960MD)

3-795-581-21 o SAFEGUARD, IMPORTANT (DXC-930/960MD)



AT-69 BC		(AT-69 BOARD)		
Ref. No.	Part No. SP Description	Ref. No.	Part No. SP Description	
1pc	A-8271-145-A a MOUNTED CIRCUIT BOARD, AT-69	D2 D3	8-719-800-76 s DIODE 1SS226 8-719-800-76 s DIODE 1SS226	
C1 C2 C3	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-179-21 s TANTALUM 2.7uF 20% 16V	D4 D5	8-719-123-82 s DIODE 1SS303 8-719-123-82 s DIODE 1SS303	
C4 C5	1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	IC1 IC2	8-759-906-54 s IC TL064CNS 8-759-300-71 s IC HD14053BFP	
C6 C7 C8	1-135-208-11 s TANTALUM 1uF 20% 10V 1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V	1C5 1C7	8-759-242-64 s IC TC4W53F 8-759-009-06 s IC MC14052BF 8-759-030-16 s IC MC34182M	
C9 C10	1-164-357-11 s CERAMIC 1000PF 5% 50V 1-135-208-11 s TANTALUM 1uF 20% 10V	IC8 IC9	8-759-906-54 s IC TL064CNS 8-759-987-41 s IC SN74HC4066NS	
C11 C12	1-135-179-21 8 TANTALUM 2.2uF 20% 16V 1-135-210-11 8 TANTALUM 4.7uF 20% 10V	IC10 IC11 IC12	8-759-011-65 s IC MC74HC4053F 8-759-908-92 s IC TL084CNS 8-759-635-27 s IC M62352GP-E1	
C13 C14 C15	1-103-210-11 \$ TANTALUM 4.7HF 20% 10V 1-164-357-11 \$ CERAMIC 1000PF 5% 50V 1-135-208-11 \$ TANTALUM 1uF 20% 10V	IC13 IC14	8-759-009-06 s IC MC14052BF 8-759-009-05 s IC MC14051BF	
C16 C17	1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	IC15 IC16 IC17	8-759-300-71 s IC HD14053BFP 8-759-300-71 s IC HD14053BFP 8-759-209-57 s IC TC4869F	
C18 C19 C20	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	IC18 IC19	8-759-209-97 s IC TC4S81F 8-759-209-97 s IC TC4S81F	
C21 C22	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-357-11 s CERANIC 1000PF 5% 50V	IC20 IC21 IC22	8-759-078-51 s TC HD63B05Y0E64F 8-759-052-64 s IC M6M80011AFP 8-759-112-72 s IC UPD6142G-101	
C23 C24 C25	Part No. SP Description  A-8271-145-A 0 MOUNTED CIRCUIT BOARD, AT-69  1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-179-21 s TANTALUM 2.2uF 20% 16V 1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 1uF 20% 10V 1-126-391-11 s ELECT, CHIP 47uF 20% 16V 1-126-391-11 s ELECT, CHIP 47uF 20% 16V 1-164-357-11 s CERAMIC 1000PF 5% 50V 1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	IC23 IC24	8-759-635-27 s IC M62352GP-E1 8-759-030-16 s IC MC34182M	
C26 C27	1-164-357-11 s CERAMIC 1000PF 5% 50V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	IC25 L1	8-759-946-03 s IC S-8054ALR-LN-S 1-412-030-11 s INDUCTOR CHIP 22uH	
C28 C29 C31	1-164-357-11 s CERAMIC 1000PF 5% 50V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-217-21 s TANTALUM 15uF 20% 6.3 1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V	L3 L4 L5	1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-408-786-21 s INDUCTOR CHIP 56uH	
C32 C33	1-135-208-11 s TANTALUM 1uF 20% 10V 1-162-957-11 s CERAMIC 220PF 5% 50V	Q1 Q2	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177	
C34 C35 C36	1-135-208-11 s TANTALUM 1uF 20% 10V 1-162-957-11 s CERAMIC 220PF 5% 50V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-166-21 s TANTALUM, CHIP 47uF 10% 10V 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V	Q3 Q4 Q5	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-80 s TRANSISTOR XP6401 8-729-117-32 s TRANSISTOR 2SC4177	
C37 C38	1-135-208-11 s TANTALUM 1uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	Q6 07	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501	
C39 C40 C41	1-164-360-11 s CERAMIC 0.1uF 16V 1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V 1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V	08 09 010	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501	
C42 C43	1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V	Q11 Q12	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177	
C44 C45 C46	1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-135-208-11 s TANTALUM 1uF 20% 10V	013 014 015	8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177	
C47 C48	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	Q16 Q17	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6	
C49 C50	1-164-357-11 s CERAMIC 1000PF 5% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	018 019 020	8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177	
C52 C53	1-135-164-21 s TANTALUM, CHIP 22uF 20% 10V 1-135-179-21 s TANTALUM 2.2uF 20% 16V	Q21 Q22	8-729-427-83 s TRANSISTOR XP6501 8-729-117-16 s TRANSISTOR ZSA1611-M6	
C54	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P	Q23 Q24	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6	
CN2	1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P	R1	8-729-117-32 s TRANSISTOR 2SC4177 1-216-836-11 s METAL, CHIP 18K 5% 1/16W	
D1 8	8-719-017-08 s DIODE 02DZ5.6-TPHR3	R2	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	

# (AT-69 BOARD)

Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
R3	Part No. SP Description  1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W	R70	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R4		R71	1-216-813-11 s METAL, CHIP 220 5% 1/16W
R5		R72	1-216-801-11 s METAL 22 0.50% 1/16W
R6		R74	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W
R7		R75	1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R8	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W	R76	1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R9	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R77	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R10	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W	R78	1-218-725-11 s METAL 24K 0.50% 1/16W
R11	1-216-819-11 s METAL, CHIP 680 5% 1/16W	R79	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R12	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W	R80	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R13	1-216-845-11 s METAL, CHIP 100K 5% 1/16W	R82	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R15	1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W	R84	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R16	1-216-841-11 s METAL, CHIP 47K 5% 1/16W	R85	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R17	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R86	1-216-837-11 s METAL, CHIP 22K 5% 1/16W
R18	1-216-857-11 s METAL, CHIP 1M 5% 1/16W	R87	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R19	1-216-841-11 s METAL, CHIP 47K 5% 1/16W	R88	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-218-883-11 s METAL, CHIP 33K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-218-740-11 s METAL 100K 0.50% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R20	1-216-837-11 s METAL, CHIP 22K 5% 1/16W	R89	
R21	1-216-834-11 s METAL, CHIP 12K 5% 1/16W	R90	
R22	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R92	
R23	1-216-809-11 s METAL, CHIP 100 5% 1/16W	R93	
R24	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R94	1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R25	1-218-714-11 s METAL 8.2K 0.50% 1/16W	R95	1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W
R26	1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	R96	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R27	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R97	1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W
R29	1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R98	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R30	1-218-716-11 s METAL 10K 0.50% 1/16W	R99	1-216-853-11 s METAL, CHIP 470K 5% 1/16W
R32	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R100	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R33	1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R101	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R34	1-216-813-11 s METAL, CHIP 220 5% 1/16W	R102	1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R35	1-216-817-11 s METAL, CHIP 470 5% 1/16W	R103	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R37	1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	R104	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W
R38	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R105	
R39	1-218-714-11 s METAL 8.2K 0.50% 1/16W	R106	
R40	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W	R107	
R41	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R108	
R42	1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R109	1-216-809-11 s METAL, CHIP 100 5% 1/16W
R44	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R110	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R45	1-216-864-11 s METAL, CHIP 0-0HM	R114	1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R46	1-216-834-11 s METAL, CHIP 12K 5% 1/16W	R115	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R48	1-218-716-11 s METAL 10K 0.50% 1/16W	R116	1-216-836-11 s METAL, CHIP 18K 5% 1/16W
R49	1-218-724-11 s METAL 22K 0.50% 1/16W	R117	1-216-842-11 s METAL, CHIP 56K 5% 1/16W
R50	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R118	1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R51	1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	R119	1-216-838-11 s METAL, CHIP 27K 5% 1/16W
R52	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R120	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R53	1-216-813-11 s METAL, CHIP 220 5% 1/16W	R121	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R54	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R122	1-216-836-11 s METAL, CHIP 18K 5% 1/16W
R55		R123	1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R57		R124	1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R58		R125	1-216-842-11 s METAL, CHIP 56K 5% 1/16W
R59		R126	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R60 R61 R62 R63 R65	1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-218-714-11 s METAL 8.2K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R127 R128 R129 R130 R131	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-838-11 s METAL, CHIP 27K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W
R66	1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	R132	1-216-809-11 s METAL, CHIP 100 5% 1/16W
R67	1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R133	
R68	1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R134	
R69	1-218-716-11 s METAL 10K 0.50% 1/16W	R135	

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(AT-69 BOARD)
                                                                                                                                                                                          CN-579 BOARD (For DXC-930/930P/960MD)
Ref. No. or Q'ty Part No. SP Description
                                                                                                                                                                                         Ref. No. or Q'ty Part No.
                                                                                                                                                                                                                                                    SP Description
                         1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W
                                                                                                                                                                                                                   A-8271-140-A o MOUNTED CIRCUIT BOARD, CN-579 (DXC-930/930P/960MD)
                                                                                                                                                                                         1pc
 R137
 R138
R139
                                                                                                                                                                                                                   1-135-076-21 s TANTALUM, CHIP 1uF 10% 35V
1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
                                                                                                                                                                                         C1
C2
C3
C4
C5
 R140
                         1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-216-864-11 s METAL, CHIP 0-0HM
 R141
 R142
R143
R145
                                                                                                                                                                                                                   1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V

1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V

1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V

1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V

1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V
                                                                                                                                                                                         C6
C7
C8
 R146
 R147
                                                                                                                                                                                         C9
                         1-216-845-11 s METAL, CHIP 100K 5% 1/16W
 RB1
                         1-231-387-00 s COMPOSITION CIRCUIT BLOCK
                                                                                                                                                                                                                   1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V
                                                                                                                                                                                         C12
C13
C14
C15
                         1-571-120-11 s SWITCH, SLIDE
1-571-249-11 s SWITCH, SLIDE
 SW2
X1
                         1-567-192-11 s RESONATOR, CERAMIC 4.00MHz
                                                                                                                                                                                                                  1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V
                                                                                                                                                                                          C16
                                                                                                                                                                                         C17
C18
                                                                                                                                                                                         C19
C20
                                                                                                                                                                                                                   1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V
1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
                                                                                                                                                                                                                  1-566-531-11 s CONNECTOR, FPC (ZIF) 15P
1-566-531-11 s CONNECTOR, FPC (ZIF) 15P
                                                                                                                                                                                         CN2
                                                                                                                                                                                         D1
D2
                                                                                                                                                                                                                  8-719-017-08 s DIODE 02DZ5.6-TPHR3
8-719-510-30 s DIODE D2FL20
                                                                                                                                                                                                               1-576-212-21 s FUSE, CHIP
1-576-212-21 s FUSE, CHIP
                                                                                                                                                                                         IC1
                                                                                                                                                                                                                  8-759-300-71 s IC HD14053BFP
                                                                                                                                                                                                                  1-410-997-31 s INDUCTOR CHIP 2.2uH
                                                                                                                                                                                        L2
L3
L4
L5
                                                                                                                                                                                                                  1-410-997-31 s INDUCTOR CHIP 2.2uH
1-410-997-31 s INDUCTOR CHIP 2.2uH
1-410-997-31 s INDUCTOR CHIP 2.2uH
1-408-781-00 s INDUCTOR CHIP 22uH
                                                                                                                                                                                        L6
L7
                                                                                                                                                                                         L19
                                                                                                                                                                                                                 8-729-427-83 s TRANSISTOR XP6501
8-729-427-74 s TRANSISTOR XP4601
8-729-427-83 s TRANSISTOR XP6501
8-729-427-74 s TRANSISTOR XP4601
8-729-117-16 s TRANSISTOR 2SA1611-M6
                                                                                                                                                                                        Q1
Q2
Q3
Q4
Q5
                                                                                                                                                                                                                 8-729-117-32 s TRANSISTOR 2SC4177
8-729-117-16 s TRANSISTOR 2SA1611-M6
8-729-117-16 s TRANSISTOR 2SA1611-M6
8-729-117-32 s TRANSISTOR 2SC4177
8-729-117-16 s TRANSISTOR 2SA1611-M6
                                                                                                                                                                                        Q6
Q7
Q8
Q9
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1-216-809-11 s METAL, CHIP 100 5% 1/16W 1-216-840-11 s METAL, CHIP 39K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W

R2 R3 R4

(CN-579 )	BOARD)	CN-580 BG	OARD (For XC-009/009P)
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
R6 R7	1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W	1pc	A-8271-134-A @ MOUNTED CIRCUIT BOARD, CN-580 (XC-009/009P)
R8 R9 R10	1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W	C1 C2	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
R11 R12	1-218-285-11 s MFTAL CHIP 75 5% 1/16W	C3 C4 C5	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
R13 R14 R15	1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W	C6 C8	
R16		C9 C10 C11	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V
R17 R18 R19	1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-883-11 s METAL, CHIP 33K 0.50% 1/16W 1-218-723-11 s METAL 20K 0.50% 1/16W	C12	1-162-966-11 s CERAMIC. CHIP 0.0022uF 10% 50V
R20 R21	1-218-701-11 s METAL 2.4K 0.50% 1/16W	C13 C14 C15	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V
R22 R23 R24	1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W	C16 CN1	1-566-531-11 s CONNECTOR, FPC (ZIF) 15P 1-566-531-11 s CONNECTOR, FPC (ZIF) 15P
R25 R26	1-218-716-11 s METAL 10K 0.50% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W	CN2 D1	8-719-510-30 s DIODE D2FL20
R28 R31 R32	1-216-864-11 s METAL, CHIP 0-OHM 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W		1-576-212-21 s FUSE, CHIP
R33	1-218-700-11 s METAL 2.2K 0.50% 1/10W	IC1	8-759-300-71 s IC HD14053BFP
R34 R35 R36 R37 R38	1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-218-271-11 s METAL 2K 0.50% 1/16W 1-218-286-11 s METAL, CHIP 91 0.50% 1/16W	L1 L2 L3 L4 L12	1-410-997-31 s INDUCTOR CHIP 2.2uH 1-410-997-31 s INDUCTOR CHIP 2.2uH 1-410-997-31 s INDUCTOR CHIP 2.2uH 1-410-997-31 s INDUCTOR CHIP 2.2uH 1-408-781-00 s INDUCTOR CHIP 22uH
R39 R40 R41 R42 R43	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W	Q1 Q2 Q3 Q4 Q5	8-729-427-83 s TRANSISTOR XP6501 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
R44 R45 R47 R48	1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W	Q6 Q7 Q8 Q9	8-729-427-83 s TRANSISTOR XP6501 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177
R49 R50	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W	Q10 R2	8-729-117-16 s TRANSISTOR 2SA1611-M6 1-216-837-11 s METAL, CHIP 22K 5% 1/16W
R51 R52 R53 R54	1-216-864-11 s METAL, CHIP 0-0HM 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W	R3 R4 R10 R11	1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W
R55 R56 R60 R61	1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W	R12 R13 R14 R15	1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W
SW1 SW2	1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE	R16 R17	1-218-285-11 s METAL, CHIP 75 5% 1/16W
SW3 SW4 SW5	1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE	R19 R20 R21 R22	1-218-883-11 s METAL, CHIP 33K 0.50% 1/16W 1-218-723-11 s METAL 20K 0.50% 1/16W 1-218-701-11 s METAL 2.4K 0.50% 1/16W 1-218-698-11 s METAL 1.8K 0.50% 1/16W
SW6 SW7	1-571-787-11 s SWITCH, TACTILE 1-571-120-11 s SWITCH, SLIDE	R23 R24	1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
		R25 R26	1-218-716-11 s METAL, CHIP IN 34 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W

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Ref. No. or Q'ty	Part No. SP Description
R27 R28 R29 R30 R31	1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-218-286-11 s METAL, CHIP 91 0.50% 1/16W
R32 R33 R34 R35 R36	1-218-271-11 s METAL 2K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W
R37 R38 R39 R40 R41	1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R42 R43 R44 R45 R46	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W
R47 R48 R49	1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W 1-216-797-11 s METAL, CHIP 10 5% 1/16W
S1 S2 S3 S4 S5	1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE 1-571-787-11 s SWITCH, TACTILE
S6 S7	1-571-787-11 s SWITCH, TACTILE 1-571-120-11 s SWITCH, SLIDE

# IF-354 BOARD

Ref. No. or Q'ty	Part No. SP Description
1pc	A-8271-143-A o MOUNTED CIRCUIT BOARD, IF-354 (DXC-930/960MD,XC-009)
C1	1-162-964-11 s CERAMIC 0.001uF 10% 50V
C2	1-164-156-11 s CERAMIC 0.1uF 25V
C3	1-135-076-21 s TANTALUM, CHIP 1uF 10% 35V
C4	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C5	1-164-156-11 s CERAMIC 0.1uF 25V
C6	1-162-905-11 s CERAMIC 1PF 0.25PF 50V
C7	1-162-928-11 s CERAMIC 120PF 5% 50V
C8	1-162-928-11 s CERAMIC 120PF 5% 50V
C9	1-126-392-11 s ELECT, CHIP 100uF 20% 6.3V
C10	1-126-396-11 s ELECT, CHIP 47uF 20% 16V
C11	1-162-908-11 s CERAMIC 3PF 0.25PF 50V
C12	1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V
C13	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C15	1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V
C16	1-164-156-11 s CERAMIC 0.1uF 25V
C17	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C18	1-162-974-11 s CERAMIC 0.01uF 50V
C19	1-162-974-11 s CERAMIC 0.01uF 50V
C20	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C21	1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V
C22	1-126-396-11 s ELECT, CHIP 47uF 20% 16V
C23	1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V
C24	1-162-907-11 s CERAMIC, CHIP 2PF 50V
C25	1-162-917-11 s CERAMIC, CHIP 15PF 5% 50V
C26	1-135-216-11 s TANTALUM 10uF 20% 10V
C27	1-162-908-11 s CERAMIC 3PF 0.25PF 50V
C28	1-162-911-11 s CERAMIC, CHIP 6PF 50V
C29	1-162-911-11 s CERAMIC, CHIP 6PF 50V
C30	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C31	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C32	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C33	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C34	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C35	1-135-211-11 s TANTALUM 6.8uF 20% 6.3
C36	1-135-211-11 s TANTALUM 6.8uF 20% 6.3
C37	1-135-211-11 s TANTALUM 6.8uF 20% 6.3
C38	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C39	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C40	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C41	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C42	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C43	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C44	1-135-181-21 s TANTALUM, CHIP 4.7uF 10% 6.3V
C45	1-162-911-11 s CERAMIC, CHIP 6PF 50V
C46	1-162-913-11 s CERAMIC 8PF 0.5PF 50V
C47	1-162-909-11 s CERAMIC 4PF 0.25PF 50V
C48	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C49	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V
C50	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C51	1-162-911-11 s CERAMIC, CHIP 6PF 50V
C52	1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V
C53	1-135-217-21 s TANTALUM 15uF 20% 6.3
C54	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V
C55	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V
C56	1-162-916-11 s CERAMIC, CHIP 12PF 5% 50V
C57	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V

(IF-354 BOARD) (IF-354 BOARD) Ref. No. or Q'ty Part No. SP Description Ref. No. or Q'ty Part No. SP Description 8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V 1-162-916-11 s CERAMIC, CHIP 12PF 5% 50V 1-135-210-11 s TANTALUM 4.7uF 20% 10V Q33 Q34 Q35 C59 C60 C61 Č62 **Q**36 8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-427-83 s TRANSISTOR XP6501 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-162-911-11 s CERAMIC, CHIP 6PF 50V Q38 Q39 Q40 C64 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P Q41 CN2 8-752-332-69 s IC CXL5504M 8-759-242-64 s IC TC4W53F 8-759-209-97 s IC TC4S81F 8-759-209-57 s IC TC4S69F 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 043 044 045 IC2 IC3 IC4 Q46 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-793-21 s INDUCTOR CHIP 220uH 1-410-719-31 s INDUCTOR CHIP 150uH 1-408-781-00 s INDUCTOR CHIP 22uH Q47 Q48 Q49 Q50 Q51 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 L2 L3 L4 L5 1-408-797-11 s INDUCTOR CHIP 470uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-793-21 s INDUCTOR CHIP 220uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH Q52 Q53 Q54 Q55 Q56 8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177 Ĺ7 L8 L9 L10 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 Q57 Q58 Q59 Q60 L12 L13 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 Q1 Q2 Q3 Q4 Q5 Q61 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501 Q63 Q64 Q6 Q7 Q8 Q9 Q10 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-836-11 s METAL, CHIP 1.5K 5% 1/16W R1 R2 R3 R4 R5 Q11 Q12 Q13 Q14 Q15 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-16 s TRANSISTOR 2SA1611-M6 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W Ř7 R8 Ŗ9 R10 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 Q16 Q17 Q18 Q19 Q20 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-839-11 s METAL, CHIP 33K 5% 1/16W R12 R13 **R14** R15 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 Q21 Q22 Q23 Q24 Q25 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W **R17 R18** R19 R20 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-74 s TRANSISTOR XP4601 8-729-427-74 s TRANSISTOR XP4601 8-729-427-74 s TRANSISTOR XP4601 Q26 Q27 Q28 Q29 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-818-11 s METAL, CHIP 560 5% 1/16W R22 R23  $\tilde{Q}\tilde{3}\tilde{0}$ Q31 8-729-427-83 s TRANSISTOR XP6501

# (IF-354 BOARD)

Ref. No. or Q'ty	Part No. SP Description
R144 R145 R146 R147 R148	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-218-708-11 s METAL 4.7K 0.50% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R149 R150 R151 R152 R153	1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W
	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-218-739-11 s METAL, CHIP 91K 0.50% 1/16W
R159	1-218-700-11 s METAL 2.2K 0.50% 1/16W
RV1 RV2 RV3 RV4 RV5	1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K
RV6 RV7	1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-090-11 s RES, ADJ CERMET 10K

# IF-354P BOARD

Ref. No. or Q'ty	Part No. SP	Description
1pc	A-8271-144-A o	MOUNTED CIRCUIT BOARD, IF-354P (DXC-930P, XC-009P)
C1 C2 C3 C4 C5	1-135-076-21 s 1-135-162-21 s	CERAMIC 0.001uF 10% 50V CERAMIC 0.1uF 25V TANTALUM, CHIP 1uF 10% 35V TANTALUM, CHIP 33uF 10% 6.3V CERAMIC 0.1uF 25V
C9	1-126-392-11 s	CERAMIC 1PF 0.25PF 50V CERAMIC 56PF 5% 50V CERAMIC 56PF 5% 50V ELECT, CHIP 100uF 20% 6.3V ELECT, CHIP 47uF 20% 16V
C11 C12 C13 C15 C16	1-162-922-11 \$	CERAMIC 4PF 0.25PF 50V CERAMIC, CHIP 39PF 5% 50V TANTALUM, CHIP 10uF 10% 20V TANTALUM, CHIP 22uF 10% 10V CERAMIC 0.1uF 25V
C17 C18 C19 C20 C21	1-162-974-11 s 1-162-974-11 s 1-135-159-21 s	TANTALUM, CHIP 10uF 10% 20V CERAMIC 0.01uF 50V CERAMIC 0.01uF 50V TANTALUM, CHIP 10uF 10% 20V ELECT, CHIP 47uF 20% 6.3V
C22 C23 C24 C25 C26	1-162-919-11 s 1-162-907-11 s	ELECT, CHIP 47uF 20% 16V CERAMIC, CHIP 22PF 5% 50V CERAMIC, CHIP 2PF 50V CERAMIC, CHIP 15PF 5% 50V TANTALUM 10uF 20% 10V
C27 C28 C29 C30 C31	1-135-162-21 s	
C32 C33 C34 C35 C36	1-162-915-11 s 1-162-915-11 s	CERAMIC, CHIP 10PF 5PF 50V CERAMIC, CHIP 10PF 5PF 50V CERAMIC, CHIP 10PF 5PF 50V TANTALUM 6.8UF 20% 6.3 TANTALUM 6.8UF 20% 6.3
C37 C38 C39 C40 C41	1-135-162-21 s 1-135-162-21 s 1-135-162-21 s	TANTALUM 6.8uF 20% 6.3 TANTALUM, CHIP 33uF 10% 6.3V TANTALUM, CHIP 33uF 10% 6.3V TANTALUM, CHIP 33uF 10% 6.3V CERAMIC, CHIP 10PF 5PF 50V
C42 C43 C44 C45 C46	1-135-162-21 s 1-135-181-21 s	CERAMIC, CHIP 10PF 5PF 50V TANTALUM, CHIP 33uF 10% 6.3V TANTALUM, CHIP 4.7uF 10% 6.3V CERAMIC, CHIP 6PF 50V CERAMIC 8PF 0.5PF 50V
C49 C50	1-162-915-11 s 1-135-162-21 s	CERAMIC 4PF 0.25PF 50V TANTALUM, CHIP 33uF 10% 6.3V CERAMIC, CHIP 10PF 5PF 50V TANTALUM, CHIP 33uF 10% 6.3V CERAMIC, CHIP 6PF 50V
C53 C54 C55	1-135-217-21 s 1-162-927-11 s 1-135-162-21 s	CERAMIC, CHIP 18PF 5% 50V TANTALUM 15uF 20% 6.3 CERAMIC, CHIP 100PF 5% 50V TANTALUM, CHIP 33uF 10% 6.3V CERAMIC, CHIP 12PF 5% 50V
C57	1-135-162-21 s	TANTALUM, CHIP 33uF 10% 6.3V

(IF-354P	BOARD)	(IF-354P	BOARD)
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
C58 C59 C60 C61 C62	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V 1-162-916-11 s CERAMIC, CHIP 12PF 5% 50V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	Q32 Q33 Q34 Q35 Q36	8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q
C63 C64	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-162-911-11 s CERAMIC, CHIP 6PF 50V	Q37 Q38 Q39	8-729-427-74 s TRANSISTOR XP4601 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-427-83 s TRANSISTOR XP6501
CN1 CN2	1-569-607-11 S CONNECTOR, BOARD TO BOARD 24P 1-569-607-11 S CONNECTOR, BOARD TO BOARD 24P	Q40 Q41	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6
IC1 IC2 IC3 IC4	8-752-332-69 s IC CXL5504M 8-759-242-64 s IC TC4W53F 8-759-209-97 s IC TC4S81F 8-759-209-57 s IC TC4S69F	Q42 Q43 Q44 Q45 Q46	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
L1 L2 L3 L4 L5	1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-410-717-31 s INDUCTOR, CHIP 100uH 1-408-790-00 s INDUCTOR CHIP 120uH 1-408-781-00 s INDUCTOR CHIP 22uH	047 048 049 050	8-729-117-16 \$ TRANSISTOR 2SA1611-M6 8-729-427-83 \$ TRANSISTOR XP6501 8-729-427-74 \$ TRANSISTOR XP4601 8-729-117-32 \$ TRANSISTOR 2SC4177 8-729-117-32 \$ TRANSISTOR 2SC4177
L6 L7 L8 L9 L10	1-408-797-11 s INDUCTOR CHIP 470uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-793-21 s INDUCTOR CHIP 220uH 1-408-781-00 s INDUCTOR CHIP 22uH 1-408-781-00 s INDUCTOR CHIP 22uH	Q52 Q53 Q54 Q55 Q56	8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-427-83 s TRANSISTOR XP6501 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177
L11 L12 L13	1-408-781-00 \$ INDUCTOR CHIP 22uH 1-408-781-00 \$ INDUCTOR CHIP 22uH	057 058	8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
Q2	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177	Q60	8-729-117-16 S TRANSISTOR ZSA1611-M6 8-729-117-16 S TRANSISTOR ZSA1611-M6 8-729-117-16 S TRANSISTOR ZSA1611-M6
	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177	Q63	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501
Q7 Q8 Q9 Q10	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177	R1 R2 R3 R4	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-836-11 s METAL, CHIP 18K 5% 1/16W
Q12 Q13 Q14 Q15	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-16 s TRANSISTOR 2SA1611-M6	R6 R7 R8 R9	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
Q17 Q18 Q19 Q20	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6	R11 R12 R13 R14	1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-839-11 s METAL, CHIP 33K 5% 1/16W
Q22 Q23 Q24 Q25	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177	R16 R17 R18 R19	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-825-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W
027 028 029	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-74 s TRANSISTOR XP4601 8-729-427-74 s TRANSISTOR XP4601 8-729-427-74 s TRANSISTOR XP4601	R21 R22 R23 R24	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
Q31 8	8-729-427-83 s TRANSISTOR XP6501	R25	1-216-818-11 s METAL, CHIP 560 5% 1/16W

R84

R143

# (IF-354P BOARD)

Ref. No. or Q'ty	Part No. SP Description
R144 R145 R146 R147 R148	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-218-708-11 s METAL 4.7K 0.50% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R149 R150 R151 R152 R153	1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W
R154 R155 R156 R157 R158	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-218-739-11 s METAL, CHIP 91K 0.50% 1/16W
R159	1-218-700-11 s METAL 2.2K 0.50% 1/16W
RV1 RV2 RV3 RV4 RV5	1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-088-11 s RES, ADJ, CERMET 2.2K
RV6 RV7	1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-090-11 s RES, ADJ CERMET 10K

# MB-380 BOARD

Ref. No.	Part No. SP Description	
1pc	A-8271-139-A o MOUNTED CIRCUIT BOARD, MB-380	
C1 C2 C3 C4 C5	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-135-160-21 s TANTALUM, CHIP 15uF 10% 16V 1-126-925-11 s ELECT 470uF 20% 10V 1-126-916-11 s ELECT 1000uF 20% 6.3 1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50	V
C7 C8	1-162-966-11 s CERAMIC, CHIP 0.0022uF 10% 50 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-135-160-21 s TANTALUM, CHIP 15uF 10% 16V 1-126-935-11 s ELECT 470uF 20% 16V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V	V
C15	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	
CN1 CN2 CN3 CN4 CN5	1-565-151-11 0 PIN, CONNECTOR (ANGLE) 4P 1-691-630-21 0 CONNECTOR, FFC/FPC (ZIF) 20P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P	)
CN6 CN7 CN8 CN9 CN10	1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-568-338-11 s CONNECTOR, BOARD TO BOARD 24P 1-690-670-12 s CABLE, FLAT (1.0MM) 15P	) )
CN11 CN12	1-690-670-12 s CABLE, FLAT (1.0MM) 15P 1-565-150-11 o PIN, CONNECTOR (ANGLE) 3P	
	8-719-017-34 s DIODE 02DZ20-TPHR3	
IC1 IC2 IC3	8-759-009-10 s IC MC14069UBF 8-759-927-46 s IC SN74HC00NS 8-759-209-57 s IC TC4S69F	
L4 L5	1-412-032-11 s INDUCTOR CHIP 100uH 1-412-032-11 s INDUCTOR CHIP 100uH 1-412-026-11 s INDUCTOR CHIP 1uH 1-410-997-31 s INDUCTOR CHIP 2.2uH 1-410-997-31 s INDUCTOR CHIP 2.2uH	
L8	1-410-997-31 s INDUCTOR CHIP 2.2uH 1-410-997-31 s INDUCTOR CHIP 2.2uH 1-412-535-41 s INDUCTOR 68UH	
PW1	1-466-696-11 s CONVERTER (DC-DC)	
R1 R2 R3 R4 R5	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-804-11 s METAL 39 5% 1/16W 1-216-804-11 s METAL 39 5% 1/16W 1-216-804-11 s METAL 39 5% 1/16W	
R6	1-216-804-11 s METAL 39 5% 1/16W	

PA-133 BOARD	PA-134 BOARD	
Ref. No. or Q'ty Part No. SP Description	Ref. No. or Q'ty Part No. SP Description	
1pc A-8271-136-A o MOUNTED CIRCUIT BOARD, PA-133	1pc A-8271-138-A o MOUNTED CIRCUIT BOARD, PA-134	
C2 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C3 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C4 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V C5 1-135-154-21 s TANTALUM, CHIP 3.3uF 20% 20V C6 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V	C2 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C3 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C4 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V C5 1-135-154-21 s TANTALUM, CHIP 3.3uF 20% 20V C6 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V	
C7 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V C8 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C9 1-135-154-21 s TANTALUM, CHIP 3.3uF 20% 20V C10 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V C11 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V	C7 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V C8 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V C9 1-135-154-21 s TANTALUM, CHIP 3.3uF 20% 20V C10 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V C11 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V	
C12 1-164-156-11 s CERAMIC 0.1uF 25V C13 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V C14 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V C15 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V C16 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	C12 1-164-156-11 s CERAMIC 0.1uF 25V C13 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V C14 1-135-164-21 s TANTALUM, CHIP 22uF 20% 10V C15 1-135-164-21 s TANTALUM, CHIP 22uF 20% 10V	
IC2 8-759-031-84 s IC SC7S04F IC3 8-759-031-84 s IC SC7S04F IC4 8-752-052-72 s IC CXA1439M	IC2 8-759-031-84 s IC SC7S04F IC3 8-752-052-72 s IC CXA1439M IC4 8-759-031-84 s IC SC7S04F	
L1 1-412-032-11 s INDUCTOR CHIP 100uH	L1 1-412-032-11 s INDUCTOR CHIP 100uH L2 1-412-029-11 s INDUCTOR CHIP 10uH	
1-412-029-11 s INDUCTOR CHIP 10uH  Q1 8-729-905-24 s TRANSISTOR 2SA1576S Q2 8-729-926-19 s TRANSISTOR 2SC4103-Q	Q1 8-729-905-24 s TRANSISTOR 2SA1576S Q2 8-729-926-19 s TRANSISTOR 2SC4103-Q	
R1 1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W R2 1-216-835-11 s METAL, CHIP 15K 5% 1/16W R3 1-216-838-11 s METAL, CHIP 27K 5% 1/16W R4 1-216-848-11 s METAL, CHIP 180K 5% 1/16W R5 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	R1 1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W R2 1-216-835-11 s METAL, CHIP 15K 5% 1/16W R3 1-216-838-11 s METAL, CHIP 27K 5% 1/16W R4 1-216-848-11 s METAL, CHIP 180K 5% 1/16W R5 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W	
R8 1-216-864-11 s METAL, CHIP 0-0HM R9 1-216-864-11 s METAL, CHIP 0-0HM	R8 1-216-864-11 s METAL, CHIP 0-OHM R9 1-216-864-11 s METAL, CHIP 0-OHM	

PR-158 B	OARD	(PR-158 F	BOARD)	
Ref. No.	Part No. SP Description	Ref. No. or Q'ty	Part No.	SP Description
1pc C1 C2	A-8271-146-A o MOUNTED CIRCUIT BOARD, PR-158 (DXC-930/960MD, XC-009) 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V	C58 C59 C60	1-164-156-11 1-164-156-11 1-135-155-21	s CERAMIC 0.1uF 25V s CERAMIC 0.1uF 25V s CERAMIC 0.1uF 25V s TANTAL CHIP 4.7uF 10% 16V s TANTALUN, CHIP 1uF 10% 16V
C2 C3 C4 C5	1-135-091-00 s TANTALUN, CHIP 1UF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1UF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1UF 10% 16V 1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V	C62	1-135-177-21 1-135-177-21 1-135-177-21	s TANTALUM, CHIP 1uF 10% 20V s TANTALUM, CHIP 1uF 10% 20V s TANTALUM, CHIP 1uF 10% 20V s CERAMIC 0.1uF 25V
C7 C8 C9 C10	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V	C66 C67 C68 C69	1-135-210-11 1-135-091-00 1-135-155-21 1-162-927-11	s TANTALUM 4.7uF 20% 10V s TANTALUN, CHIP 1uF 10% 16V s TANTAL CHIP 4.7uF 10% 16V s CERAMIC, CHIP 100PF 5% 50V
C11 C12 C13 C14	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V	C70 C71	1-162-915-11	s CERAMIC 47PF 5% 50V s CERAMIC, CHIP 10PF 5PF 50V s TANTALUM, CHIP 10uF 10% 6.3V
C15 C16 C17 C18	1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-135-091-00 s TANTALUM, CHIP 1uF 10% 16V	C72 C73 C74 C75 C76	1-164-156-11 1-135-157-21 1-135-091-00	S CERAMIC 0.1uF 25V TANTALUM, CHIP 10uF 10% 6.3V TANTALUN, CHIP 1uF 10% 16V S CERAMIC 0.1uF 25V
C19 C20 C21 C22	1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V	C77 C78 C79 C80 C81	1-135-177-21 1-135-180-21 1-135-180-21	S TANTALUM, CHIP 68uF 20% 6.3V S TANTALUM, CHIP 1uF 10% 20V S TANTALUM, CHIP 3.3uF 20% 6.3V S TANTALUM, CHIP 3.3uF 20% 6.3V S TANTALUM 4.7uF 20% 10V
C23 C24 C25	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V	C82	1-135-210-11	s TANTALUM 4.7uF 20% 10V s TANTALUM, CHIP 10uF 10% 20V s CERAMIC, CHIP 100PF 5% 50V s CERAMIC, CHIP 33PF 5% 50V
C26 C27 C28 C29 C30	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V	C86 C87 C88	1-162-921-11 1-135-159-21 1-164-156-11	s TANTALUM, CHIP 10uF 10% 20V s CERAMIC 0.1uF 25V
C31 C32 C33 C34	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V	C90 C91	1-135-180-21 1-162-927-11	s TANTALUM, CHIP 22uF 10% 10V s TANTALUM, CHIP 3.3uF 20% 6.3V s CERAMIC, CHIP 100PF 5% 50V s CERAMIC, CHIP 0.01uF 10% 25V
C35 C36 C37	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V	C93 C94 C95	1-162-927-11 1-135-208-11 1-162-970-11	S CERAMIC, CHIP 100PF 5% 50V S TANTALUM 1UF 20% 10V S CERAMIC, CHIP 0.01UF 10% 25V S TANTALUM, CHIP 3.3UF 20% 6.3V
C38 C39 C40	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-964-11 s CERAMIC 0.001uF 10% 50V	C99 C100 C101	1-135-210-11 1-164-156-11 1-164-156-11	s TANTALUM, CHIP 10uF 10% 6.3V s TANTALUM 4.7uF 20% 10V s CERAMIC 0.1uF 25V s CERAMIC 0.1uF 25V
C42 C43 C44 C45	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-177-21 s TANTALUM, CHIP 1uF 10% 20V	C103 C104	1-162-927-11 1-164-156-11	s CERAMIC, CHIP 27PF 5% 50V s CERAMIC, CHIP 100PF 5% 50V s CERAMIC 0.1uF 25V s TANTALUM, CHIP 22uF_10% 10V
C46 C47 C48 C49	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	C106 C107 C108	1-135-152-21 1-135-157-21 1-162-921-11	s TANTALUM, CHIP 1.5uF 10% 25V s TANTALUM, CHIP 10uF 10% 6.3V s CERAMIC. CHIP 33PF 5% 50V
C50 C51 C52	1-162-910-11 s CERAMIC 5PF 0.25PF 50V  1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN. CHIP 1uF 10% 16V	C109 C110 C111	1-162-921-11 1-162-925-11 1-135-161-21	S CERAMIC, CHIP 33PF 5% 50V S CERAMIC, CHIP 68PF 5% 50V S TANTALUM, CHIP 22uF 10% 10V S TANTALUM, CHIP 10uF 10% 6.3V
C53 C54 C55 C56	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	C114 C115	1-162-920-11 1-162-962-11	s TANTALUM, CHIP 10uF 10% 6.3V s CERAMIC, CHIP 27PF 5% 50V s CERAMIC 470PF 10% 50V s CERAMIC, CHIP 100PF 5% 50V

(PR-158	BOARD)	(PR-158 )	BOARD)
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
C117 C118	1-126-391-11 * ELECT, CHIP 47uF 20% 6.3V 1-135-159-21 * TANTALUM, CHIP 10uF 10% 20V	L14 LV1	1-412-032-11 s INDUCTOR CHIP 100uH 1-414-071-21 s COIL, VAR
C119 C120 C121	1-164-156-11 s CERAMIC 0.1uF 25V 1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V		8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501
C122 C123 C124 C125	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	Q1 Q2 Q3 Q4 Q5	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
C126	1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-162-964-11 s CERAMIC 0.001uF 10% 50V	Q6 Q7 Q8	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SC852-X4
C1 28 CN1	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P	Q9 Q10	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
CN2 D1	1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P 8-719-123-85 s DIODE 1SS304	Q11 Q12 Q13	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q
D2 DL1	8-719-123-85 s DIODE 188304 1-415-730-21 s DELAY LINE, LC 100n8	Q14 Q15	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
DL2 DL3 DL4 DL5	1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS 1-415-864-21 s DELAY LINE, LC 1-415-763-21 s DELAY LINE, LC	Q16 Q17 Q18 Q19 Q20	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
DL6 DL7 DL8	1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS	021 022 023	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-926-19 s TRANSISTOR 2SC4103-Q
FL1 FL2 FL3	1-409-496-21 s FILTER, LC TRAP 1-409-496-21 s FILTER, LC TRAP 1-409-496-21 s FILTER, LC TRAP	Q24 Q25	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
FL4 IC1 IC2 IC3 IC4	1-239-212-21 s FILTER, BAND PASS  8-759-030-16 s IC MC34182M  8-759-300-71 s IC HD14053BFP  8-759-234-77 s IC TC4866F  8-759-234-77 s IC TC4866F	Q26 Q27 Q28 Q29 Q30	8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q
IC4 IC5 IC6	8-759-209-57 s IC TC4S69F 8-759-030-16 s IC MC34182M	Q31 Q32 Q33	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
IC7 IC8 IC9	8-759-234-77 s IC TC4\$66F 8-759-052-67 s IC UPC2372GF-3B9 8-759-030-16 s IC MC34182M	Q34 Q35	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501
IC10 IC11	8-759-927-46 s IC SN74HCOONS 8-759-926-37 s IC SN74HC193ANS	Q36 Q37 Q38	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SK852-X4
IC12 IC13 IC14	8-759-925-83 \$ IC \$N74HC27NS 8-759-635-27 \$ IC M62352GP-E1 8-759-906-59 \$ IC CX22017	Q39 Q40	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177
IC15	8-759-209-57 s IC TC4S69F	Q41 Q42	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177
IC16 IC17 IC18	8-759-635-27 s IC M62352GP-E1 8-752-056-59 s IC CXA1592R 8-759-635-27 s IC M62352GP-E1	Q43 Q44 Q45	8-729-117-32 \$ TRANSISTOR 2504177 8-729-427-83 \$ TRANSISTOR XP6501 8-729-117-32 \$ TRANSISTOR 2504177
L1 L2 L3 L4 L5	1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-412-032-11 s INDUCTOR CHIP 100uH	Q46 Q47 Q48 Q49 Q50	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501 8-729-429-98 s TRANSISTOR XP1401
L6 L7 L8 L12 L13	1-412-032-11 s INDUCTOR CHIP 100uH 1-412-032-11 s INDUCTOR CHIP 100uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-412-034-11 s INDUCTOR CHIP 330uH 1-412-034-11 s INDUCTOR CHIP 330uH	Q51 Q52 Q53 Q54 Q55	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177

### (PR-158 BOARD)

Ref. No. or Q'ty	Part No. SP Description
R217	1-216-836-11 s METAL, CHIP 18K 5% 1/16W
R218	1-218-697-11 s METAL 1.6K 0.50% 1/16W
R219	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R220	1-216-835-11 s METAL, CHIP 15K 5% 1/16W
R221	1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W
R222	1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W
R223	1-218-271-11 s METAL 2K 0.50% 1/16W
R224	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R225	1-218-271-11 s METAL 2K 0.50% 1/16W
R226	1-218-724-11 s METAL 22K 0.50% 1/16W
R227 R228 R229 R230 R231	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-839-11 s METAL, CHIP 33K 5% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-838-11 s METAL, CHIP 27K 5% 1/16W
R232	1-216-838-11 s METAL, CHIP 27K 5% 1/16W
R233	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R234	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R235	1-218-724-11 s METAL 22K 0.50% 1/16W
R236	1-218-724-11 s METAL 22K 0.50% 1/16W
R237	1-218-724-11 s METAL 22K 0.50% 1/16W
R238	1-218-704-11 s METAL 3.3K 0.50% 1/16W
R239	1-216-864-11 s METAL, CHIP 0-0HM
R241	1-218-289-11 s METAL 510 5% 1/16W
R242	1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R243	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W
R244	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R245	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R246	1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R247	1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W
R248 R249 R250 R251 R252	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-218-704-11 s METAL 3.3K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R253 R254 R255 R256 R257	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R258	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R259	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R260	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R261	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R262	1-216-845-11 s METAL, CHIP 100K 5% 1/16W
R263	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R264	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W
R265	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R266	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R267	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R268 R269 R270 R271 R272	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-818-11 s METAL, CHIP 560 5% 1/16W
R274	1-216-835-11 s METAL, CHIP 15K 5% 1/16W
R275	1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W
R276	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W
R277	1-216-821-11 s METAL, CHIP 1K 5% 1/16W

or Q'ty	Part No. SP Description
R278 R279 R280 R281 R282	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-865-11 s METAL 3K 0.50% 1/16W 1-216-865-11 s METAL 3K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
R283 R284 R285 R286 R287	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W
R288 R289 R290 R291 R292	1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
R293 R294 R295 R296	1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W
RV1 RV2 RV3 RV5 RV6	1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-090-11 s RES, ADJ CERMET 1OK 1-238-089-11 s RES, ADJ CERMET 4.7K
RV7 RV8 RV9 RV10 RV11	1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-087-11 s RES, ADJ CERMET 1K
RV12 RV13 RV14 RV15	1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K

PR-158P BOARD (PR-158P BOARD)			
Ref. No.		Ref. No. or Q'ty	Part No. SP Description
1pc	A-8271-147-A o MOUNTED CIRCUIT BOARD, PR-158P (DXC-930P,XC-009P)	C57 C58 C59	1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V
C1 C2 C3 C4 C5	1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V	C60 C61 C62 C63	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-177-21 s TANTALUM, CHIP 1uF 10% 20V 1-135-177-21 s TANTALUM, CHIP 1uF 10% 20V
C6 C7 C8	1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V	C64 C65 C66	1-135-177-21 s TANTALUM, CHIP luf 10% 20V 1-164-156-11 s CERAMIC 0.luf 25V 1-135-210-11 s TANTALUM 4.7uf 20% 10V
C9 C10 C11	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-927-11 s CERAMIC, CHIP 10PF 5% 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	C67 C68 C69 C70	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-949-11 s CERAMIC 47PF 5% 50V
C12 C13 C14	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-091-00 s TANTALIN, CHIP 1uF 10% 16V	C71 C72 C73	1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V
C15 C16 C17	1-125-351-11 \$ ELECT, CHIP 474F 204 0.3V 1-135-162-21 \$ TANTALUM, CHIP 334F 10% 6.3V 1-135-162-21 \$ TANTALUM, CHIP 334F 10% 6.3V 1-135-091-00 \$ TANTALUM, CHIP 14F 10% 16V	C74 C75 C76	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V
C18 C19 C20	1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V	C77 C78 C79 C80	1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V 1-135-177-21 s TANTALUM, CHIP 1uF 10% 20V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V
C22 C23 C24 C25	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V	C81 C82 C83	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C26 C27 C28	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V	C84 C85 C86	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V 1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V
C29 C30 C31	1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	C87 C88 C89 C90	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V
C32 C33 C34 C35	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	C91 C92 C93	1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-164-155-11 s CERAMIC 75PF 5% 50V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-164-155-11 s CERAMIC 75PF 5% 50V
C36 C37 C38	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V	C94 C95 C96	1-135-208-11 s TANTALUM 1uF 20% 10V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-135-216-11 s TANTALUM 10uF 20% 10V
C39 C40 C41	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-964-11 s CERAMIC 0.001uF 10% 50V	C97 C98 C99 C100	1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V
C42 C43 C44	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	C101 C102 C103	1-164-156-11 s CERAMIC 0.1uf 25V 1-162-920-11 s CERAMIC, CHIP 27PF 5% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V
C45 C46 C47	1-135-177-21 s TANTALUM, CHIP 10F 10% 20V  1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V  1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V	C104 C105 C106	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V 1-135-152-21 s TANTALUM, CHIP 1.5uF 10% 25V
C48 C49 C50	1-135-167-21 s TANTALUM, CHIP 68uF 20% 6.3V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-162-910-11 s CERAMIC 5PF 0.25PF 50V	C107 C108 C109	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V 1-162-921-11 s CERAMIC, CHIP 33PF 5% 50V
C51 C52 C53 C54	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	C110 C111 C112	1-162-925-11 s CERAMIC, CHIP 68PF 5% 50V 1-135-161-21 s TANTALUM, CHIP 22uF 10% 10V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V
C55 C56	1-135-162-21 s TANTALUM, CHIP 33uF 10% 6.3V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	C113 C114 C115	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-162-920-11 s CERAMIC, CHIP 27PF 5% 50V 1-162-962-11 s CERAMIC 470PF 10% 50V

(PR-158P	BOARD)	(PR-158P	BOARD)
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
C116 C117	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-126-391-11 s ELECT, CHIP 47uF 20% 6.3V	L14	1-412-032-11 s INDUCTOR CHIP 100uH
C118 C119	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-156-11 s CERAMIC 0.1uF 25V	LV1	1-414-071-21 s COIL, VAR
C120 C121	1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	01 02 03 04 05	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177
C122 C123 C124	1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V		8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
C125 C126	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	Q6 Q7	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SK852-X4
C127 C128	1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-162-964-11 s CERAMIC 0.001uF 10% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	08 09 010	8-729-117-32 \$ TRANSISTOR 2SR632-X4 8-729-117-32 \$ TRANSISTOR 2SC4177 8-729-117-16 \$ TRANSISTOR 2SA1611-M6
CN1 CN2	1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P	Q11 Q12	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
D1 D2	8-719-123-85 s DIODE 1SS304 8-719-123-85 s DIODE 1SS304	013 014 015	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
DL1 DL2	1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS	Q16 Q17	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
DL3 DL4 DL5	1-415-730-21 s DELAY LINE, LC 100nS 1-415-864-21 s DELAY LINE, LC 1-415-763-21 s DELAY LINE, LC	Q18 Q19 Q20	8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
DL6 DL7	1-415-730-21 s DELAY LINE, LC 100nS 1-415-730-21 s DELAY LINE, LC 100nS		8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6
DL8 FL1	1-415-730-21 s DELAY LINE, LC 100nS 1-409-496-21 s FILTER, LC TRAP	Q21 Q22 Q23 Q24 Q25	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
FL2 FL3 FL4	1-409-496-21 s FILTER, LC TRAP 1-409-496-21 s FILTER, LC TRAP		8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177
IC1	1-239-211-21 s FILTER, BANDPASS 8-759-030-16 s IC MC34182M	Q26 Q27 Q28 Q29 Q30	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
IC2 IC3 IC4	0 100 201 11 8 IO IO3001	Q30 Q31 Q32	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
IC5 IC6	8-759-209-57 s IC TC4S69F 8-759-030-16 s IC MC34182M	Q32 Q33 Q34	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6
IC7 IC8 IC9	8-759-234-77 s IC TC4S66F 8-759-052-67 s IC UPC2372GF-3B9	Q35	8-729-427-83 s TRANSISTOR XP6501 8-729-926-19 s TRANSISTOR 2SC4103-Q
IC1 <b>0</b>	8-759-030-16 s IC MC34182M 8-759-927-46 s IC SN74HC00NS	Q36 Q37 Q38	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SK852-X4
IC11 IC12 IC13	8-759-926-37 s IC SN74HC193ANS 8-759-925-83 s IC SN74HC27NS 8-759-635-27 s IC M62352GP-E1	Q39 Q40	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177
IC14 IC15	8-759-906-59 s IC CX22017 8-759-209-57 s IC TC4S69F	Q41 Q42 Q43	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-74 s TRANSISTOR XP4601 8-729-117-32 s TRANSISTOR 2SC4177
IC16 IC17	8-759-635-27 s IC M62352GP-E1 8-752-056-59 s IC CXAL592R	Q44 Q45	8-729-427-83 s TRANSISTOR XP6501 8-729-117-32 s TRANSISTOR 2SC4177
IC18 L1	8-759-635-27 s IC M62352GP-E1 1-412-030-11 s INDUCTOR CHIP 22uH	Q46 Q47	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
L2 L3 L4	1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH 1-412-030-11 s INDUCTOR CHIP 22uH	Q48 Q49 Q50	8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501 8-729-429-98 s TRANSISTOR XP1401
L5	1-412-032-11 s INDUCTOR CHIP 100uH	<b>0</b> 51	8-729-117-32 s TRANSISTOR 2SC4177
L6 L7 L8	1-412-032-11 s INDUCTOR CHIP 100uH 1-412-032-11 s INDUCTOR CHIP 100uH 1-412-030-11 s INDUCTOR CHIP 22uH	052 053 054	8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
L12 L13	1-412-034-11 s INDUCTOR CHIP 330uH 1-412-034-11 s INDUCTOR CHIP 330uH	Q55	8-729-117-32 s TRANSISTOR 2SC4177

(PR-158P BOARD) (PR-158P BOARD) Ref. No. or Q'ty Part No. SP Description Ref. No. or Q'ty Part No. SP Description 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-218-484-11 s METAL 750 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-218-705-11 s METAL 3.6K 0.50% 1/16W 8-729-427-83 s TRANSISTOR XP6501 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 Q56 Q57 Q58 Q59 R27 R28 R29 R30 Q60 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-427-83 s TRANSISTOR XP6501 8-729-926-19 s TRANSISTOR 2SC4103-Q R32 R33 062 063Q64 Q65 R34 R35 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W R36 R37 068 068 R38 R39 069 R40 Ž70 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 Q71 Q72 Q73 Q74 Q75 R42 R43 R44 R45 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-836-11 s METAL, CHIP 18K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q Q76 Q77 Q78 **R46** R47 R48 R49 R50 Ò80 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-840-11 s METAL, CHIP 39K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 Q81 Q82 Q83 R52 R53 084 R54 **Q**85 R55 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-828-11 s METAL, CHIP 1K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W R56 R57 R58 R59 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 Q87 **0**89 Q90 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-218-330-11 s METAL 11K 0.50% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W R60 R2 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W R3 R4 R62 R63 R64 R65 R66 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-220-373-11 s METAL 620 0.50% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-218-457-11 s METAL 910 0.50% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-218-484-11 s METAL 750 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R8 R9 **R68** R69 R10 R70 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-836-11 s METAL, CHIP 18K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-840-11 s METAL, CHIP 39K 5% 1/16W R71 R12 R13 1-218-705-11 s METAL 3.6K 0.50% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W R14 R15 R73 R74 R75 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R76 R16 R17 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W **R77** R18 R78 **R79** R80 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R81 R22 R23 R24 R25 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W R82 R83 R84

(PR-158P BOARD)	(PR-158P BOARD)
Ref. No. or Q'ty Part No. SP Description	Ref. No. or Q'ty Part No. SP Description
R86 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R87 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R88 1-218-700-11 s METAL 2.2K 0.50% 1/16W R89 1-216-836-11 s METAL, CHIP 18K 5% 1/16W R90 1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R155 1-216-836-11 s METAL, CHIP 18K 5% 1/16W R156 1-216-845-11 s METAL, CHIP 100K 5% 1/16W R157 1-218-729-11 s METAL 36K 0.50% 1/16W R158 1-216-841-11 s METAL, CHIP 47K 5% 1/16W R159 1-216-834-11 s METAL, CHIP 12K 5% 1/16W
R91 1-216-840-11 & METAL, CHIP 39K 5% 1/16W R92 1-216-845-11 & METAL, CHIP 100K 5% 1/16W R93 1-216-824-11 & METAL, CHIP 1.8K 5% 1/16W R94 1-216-827-11 & METAL, CHIP 3.3K 5% 1/16W R95 1-216-850-11 & METAL 270K 5% 1/16W	R160 1-218-729-11 s METAL 36K 0.50% 1/16W R161 1-216-834-11 s METAL, CHIP 12K 5% 1/16W R162 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R163 1-218-729-11 s METAL 36K 0.50% 1/16W R164 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R96 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R97 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W R98 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R99 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W R100 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R165 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R167 1-218-257-11 s METAL, CHIP 4.99K 0.5% 1/10W 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W
R101 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R102 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W R103 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R104 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R105 1-216-845-11 s METAL, CHIP 100K 5% 1/16W	R170 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W R173 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W R174 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R175 1-216-809-11 s METAL, CHIP 100 5% 1/16W
R105 1-216-845-11 s METAL, CHIP 100K 5% 1/16W R106 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R107 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R108 1-216-845-11 s METAL, CHIP 100K 5% 1/16W R109 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R110 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R176 1-216-837-11 s METAL, CHIP 22K 5% 1/16W R177 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R178 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W R179 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R180 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R111 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R112 1-216-841-11 s METAL, CHIP 47K 5% 1/16W R113 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R114 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R115 1-216-821-11 s METAL, CHIP 1K 5% 1/16W	R181 1-218-271-11 s METAL 2K 0.50% 1/16W R182 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R183 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W R184 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W R185 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W
R116 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R117 1-216-841-11 s METAL, CHIP 47K 5% 1/16W R118 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R119 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W R120 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R186 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W R188 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R189 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R190 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R121 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R122 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R123 1-218-484-11 s METAL 750 0.50% 1/16W R124 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R125 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W	R191 1-218-271-11 s METAL 2K 0.50% 1/16W R192 1-216-839-11 s METAL, CHIP 33K 5% 1/16W R193 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R194 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W R197 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W
R126 1-218-705-11 s METAL 3.6K 0.50% 1/16W R127 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W R128 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R129 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W R130 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W	R198 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W R199 1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W R200 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W R201 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R202 1-218-289-11 s METAL 510 5% 1/16W
R131 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R132 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W R133 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W R134 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R135 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	R203 1-216-834-11 s METAL, CHIP 12K 5% 1/16W R204 1-218-289-11 s METAL 510 5% 1/16W R205 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W R206 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W R207 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W
R136 1-218-700-11 s METAL 2.2K 0.50% 1/16W R137 1-218-259-11 s METAL, CHIP 13.7K 0.5% 1/10W R138 1-218-254-11 s METAL, CHIP 2.55K 0.5% 1/10W R140 1-218-295-11 s METAL 5.6K 0.50% 1/16W R141 1-216-865-11 s METAL 3K 0.50% 1/16W	R208 1-216-837-11 s METAL, CHIP 22K 5% 1/16W R209 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W R210 1-216-837-11 s METAL, CHIP 22K 5% 1/16W R211 1-216-837-11 s METAL, CHIP 22K 5% 1/16W R213 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R142 1-218-721-11 s METAL 16K 0.50% 1/16W R152 1-218-254-11 s METAL, CHIP 2.55K 0.5% 1/10W R153 1-216-834-11 s METAL, CHIP 12K 5% 1/16W R154 1-216-814-11 s METAL, CHIP 270 5% 1/16W	R214 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R215 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W R216 1-216-837-11 s METAL, CHIP 22K 5% 1/16W R217 1-216-836-11 s METAL, CHIP 18K 5% 1/16W

Ref. No. or Q'ty	Part No. SP Description
R218 R219 R220 R221 R222	1-218-697-11 s METAL 1.6K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W
R223 R224 R225 R226 R227	1-218-271-11 s METAL 2K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-218-271-11 s METAL 2K 0.50% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W
R228 R229 R230 R231 R232	1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-839-11 s METAL, CHIP 33K 5% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-216-838-11 s METAL, CHIP 27K 5% 1/16W 1-216-838-11 s METAL, CHIP 27K 5% 1/16W
R233 R234 R235 R236 R237	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W
R238 R240 R241 R242 R243	1-218-704-11 s METAL 3.3K 0.50% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-218-289-11 s METAL 510 5% 1/16W 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W
R244 R245 R246 R247 R248	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
R249 R250 R251 R252 R253	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-218-704-11 s METAL 3.3K 0.50% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
R254 R255 R256 R257 R258	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R259 R260 R261 R262 R263	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
R264 R265 R266 R267 R268	1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
R269 R270 R271 R272 R273	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-818-11 s METAL, CHIP 560 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W
R274 R275 R276 R277	1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W

Ref. No. or Q'ty	Part No. SP Description
R278 R279 R280 R281 R282	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-865-11 s METAL 3K 0.50% 1/16W 1-216-865-11 s METAL 3K 0.50% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
R283 R284 R285 R286 R287	1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W
R288 R289 R290 R291 R292	1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
R293 R294 R295 R296	1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W 1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W
RV1 RV2 RV3 RV5 RV6	1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-090-11 s RES, ADJ CERMET 10K 1-238-089-11 s RES, ADJ CERMET 4.7K
RV7 RV8 RV9 RV10 RV11	1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-089-11 s RES, ADJ CERMET 4.7K 1-238-088-11 s RES, ADJ, CERMET 2.2K 1-238-087-11 s RES, ADJ CERMET 1K
RV12 RV13 RV14 RV15	1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K 1-238-087-11 s RES, ADJ CERMET 1K

SG-194 BOARD (SG-194			BOARD)
Ref. No.	Part No. SP Description	Ref. No.	Part No. SP Description
1pc	A-8271-141-A σ MOUNTED CIRCUIT BOARD, SG-194 (DXC-930/960MD, XC-009)	C58 C59 C60	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V
C1 C2 C3 C4 C5	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-227-11 s CERAMIC 0.022uF 10% 25V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V	C61 C62 C63	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-315-11 s CERAMIC 470PF 5% 50V
	1-164-156-11 s CERAMIC'0.1uF 25V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	C65 C67	1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V 1-164-156-11 s CERAMIC 0.1uF 25V
C6 C7 C8	1-126-392-11 s ELECT, CHIP 100uF 20% 6.3V 1-126-392-11 s ELECT, CHIP 100uF 20% 6.3V	CN1	1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P
C8 C9 C10	1-135-091-00 s TANTALUN, CHIP luf 10% 16V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	CP1 CP2	1-577-181-11 s OSCILLATOR, CRYSTAL 28.63636MHz 1-577-089-11 s OSCILLATOR, CRYSTAL 14.31818MHz
C11 C12 C13 C14	1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-920-11 s CERAMIC, CHIP 27PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	D1 D2 D3	8-719-800-76 s DIODE 1SS226 8-719-800-76 s DIODE 1SS226 8-719-800-76 s DIODE 1SS226
C15	1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V	IC1 IC2	8-759-100-96 s IC UPC4558G2 8-759-300-71 s IC HD14053BFP
C16 C17 C18 C19	1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V 1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V	IC3 IC4 IC5	8-759-300-71 s IC HD14053BFP 8-759-987-27 s IC LM1881M 8-759-702-08 s IC NJM360M
C20	1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V	IC6 IC7 IC8	8-752-335-47 s IC CXD1216M 8-759-234-77 s IC TC4S66F 8-759-030-16 s IC MC34182M
C21 C22 C23 C24 C25	1-135-166-21 s TANTALUM, CHIP 47uF 10% 10V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	IC10 IC11	8-752-332-67 s IC CXD1217M 8-759-239-34 s IC TC74HC4538AF
C26	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V	IC12 IC13 IC14	8-759-100-94 s IC UPC358G2 8-759-902-88 s IC SN74LS123NS 8-759-209-57 s IC TC4S69F
C27 C28 C29 C30	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	L2 L3 L4	1-412-031-11 s INDUCTOR CHIP 47uH 1-412-032-11 s INDUCTOR CHIP 100uH 1-412-031-11 s INDUCTOR CHIP 47uH
C31 C32 C33	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V	Q1 Q2 Q3	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177
C34 C35	1-135-166-21 s TANTALUM, CHIP 47uF 10% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	Q4 Q5	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SK852-X4
C36 C37 C38 C39	1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V 1-164-363-11 s CERAMIC 560PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V	Q6 Q7 Q8 Q9	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177
C40	1-164-677-11 s CERAMIC 0.033uF 10% 16V	Q10	8-729-117-32 s TRANSISTOR 2SC4177
C41 C42 C43	1-135-215-21 s TANTALUM 6.8uF 20% 16V 1-135-215-21 s TANTALUM 6.8uF 20% 16V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V	Q11 Q12	8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177
C44 C45	1-135-216-11 s TANTALUM 10uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	R1 R2	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W
C46 C47	1-164-156-11 s CERAMIC 0.1uF 25V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V	R3 R4 R5	1-216-801-11 s METAL 22 0.50% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16V
C48 C49 C50	1-135-216-11 s TANTALUM 10uF 20% 10V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V	R6 R7	1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W
C51 1-135-190-21 s TANTALUM 0.1uF 20% 20V C52 1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V	R8 R9 R10	1-216-851-11 s METAL, CHIP 330K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-218-725-11 s METAL 24K 0.50% 1/16W	
C53 C54 C56	1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-957-11 s CERAMIC 220PF 5% 50V	R11	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W
C57	1-162-957-11 S CERAMIC 220PF 5% 50V	R12 R13 R14	1-216-847-11 s METAL, CHIP 150K 5% 1/16W 1-218-344-11 s METAL 7.5K 0.50% 1/16W 1-218-695-11 s METAL 1.3K 0.50% 1/16W

### (SG-194 BOARD)

Ref. No. or Q'ty Part No. SP Description 1-218-289-11 s METAL 510 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-842-11 s METAL, CHIP 56K 5% 1/16W R16 R17 R18 R19 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-218-714-11 s METAL 8.2K 0.50% 1/16W 1-216-855-11 s METAL 680K 5% 1/16W 1-216-818-11 s METAL, CHIP 560 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R21 R22 R23 **R24** 1-216-811-11 s METAL, CHIP 150 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM 1-216-864-11 s METAL, CHIP 0-OHM **R26** R28 R30 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W R35 R36 R37 R38 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R40 R41 R43 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R45 R46 R47 R48 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W R51 R52 R54 R55 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM 1-218-740-11 s METAL 100K 0.50% 1/16W 1-218-883-11 s METAL, CHIP 33K 0.50% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W R57 R59 R60 R61 1-218-701-11 s METAL 2.4K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-218-668-11 s METAL, CHIP 100 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W R62 R63 R64 R65 1-218-668-11 s METAL, CHIP 100 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-216-838-11 s METAL, CHIP 27K 5% 1/16W 1-216-804-11 s METAL 39 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W R67 R68 R69 R70 R71 1-218-723-11 s METAL 20K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-218-727-11 s METAL 30K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W R73 R74 R75 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W R78 R79

### (SG-194 BOARD)

Ref. No. or Q'ty	Part No. SP	Description
R81 R82 R83 R84 R85	1-216-817-11 s 1-216-845-11 s 1-218-716-11 s	METAL, CHIP 470 5% 1/16W METAL, CHIP 470 5% 1/16W METAL, CHIP 100K 5% 1/16W METAL 10K 0.50% 1/16W METAL 3K 0.50% 1/16W
R86 R87 R88 R89 R90		METAL 5.6K 0.50% 1/16W METAL, CHIP 8.2K 5% 1/16W METAL, CHIP 2.2K 5% 1/16W METAL, CHIP 22K 5% 1/16W METAL, CHIP 2.7K 5% 1/16W
R91 R92 R93 R94 R95	1-216-826-11 s 1-216-829-11 s 1-216-826-11 s 1-216-819-11 s 1-216-821-11 s	ACCOUNTS ASSESSED A SECOND
R96 R97	1-216-825-11 s 1-216-809-11 s	METAL, CHIP 2.2K 5% 1/16W METAL, CHIP 100 5% 1/16W
RV1	1-238-090-11 s	RES, ADJ CERMET 10K

SG-194P BOARD			(SG-194P BOARD)		
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description		
1pc	A-8271-142-A 0 MOUNTED CIRCUIT BOARD, SG-194P (DXC-930P, XC-009P)	C58 C59 C60	1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V		
C1 C2 C3 C4 C5	1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-227-11 s CERAMIC 0.022uF 10% 25V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-164-156-11 s CERAMIC 0.1uF 25V	C61 C62 C63 C65	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-315-11 s CERAMIC 470PF 5% 50V 1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V		
	1-135-159-21 s TANTALIM CHIP 10uF 10% 20V	C67 CN1	1-164-156-11 s CERAMIC 0.1uF 25V 1-569-607-11 s CONNECTOR, BOARD TO BOARD 24P		
C6 C7 C8 C9 C10	1-126-392-11 s ELECT, CHIP 100uF 20% 6.3V 1-126-392-11 s ELECT, CHIP 100uF 20% 6.3V 1-135-091-00 s TANTALUN, CHIP 1uF 10% 16V 1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V	CP1 CP2	1-577-182-11 s OSCILLATOR, CRYSTAL 1-577-183-11 s OSCILLATOR, CRYSTAL 17.734475 MHZ		
C11 C12 C13 C14	1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-920-11 s CERAMIC, CHIP 27PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-135-210-11 s TANTALUM 4.7uF 20% 10V	D1 D2 D3	8-719-800-76 s DIODE 1SS226 8-719-800-76 s DIODE 1SS226 8-719-800-76 s DIODE 1SS226		
Č15 C16 C17 C18	1-162-916-11 s CERAMIC, CHIP 12PF 5% 50V  1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-135-190-21 s TANTALUM 0.1uF 20% 20V	IC1 IC2 IC3 IC4 IC5	8-759-100-96 s IC UPC4558G2 8-759-300-71 s IC HD14053BFP 8-759-300-71 s IC HD14053BFP 8-759-987-27 s IC LM1881M 8-759-702-08 s IC NJM360M		
C19 C20	1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V 1-135-149-21 s TANTALUM, CHIP 2.2uF 10% 10V 1-135-091-00 s TANTALUM, CHIP 1uF 10% 16V	IC6 IC7	8-752-335-47 s IC CXD1216M 8-759-234-77 s IC TC4S66F		
C21 C22 C23 C24 C25	1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-135-166-21 s TANTALUM, CHIP 47uF 10% 10V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V	IC8 IC10 IC11	8-759-030-16 s IC MC34182M 8-752-332-67 s IC CXD1217M 8-759-239-34 s IC TC74HC4538AF		
C26 C27 C28 C29	1-135-155-21 s TANTAL CHIP 4.7uF 10% 16V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	IC12 IC13 IC14	8-759-100-94 s IC UPC358G2 8-759-902-88 s IC SN74LS123NS 8-759-209-57 s IC TC4S69F		
C28 C29 C30	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	L2 L3 L4	1-412-031-11 s INDUCTOR CHIP 47uH 1-412-032-11 s INDUCTOR CHIP 100uH 1-412-031-11 s INDUCTOR CHIP 47uH		
C31 C32 C33 C34 C35	1-135-210-11 s TANTALUM 4.7uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-135-166-21 s TANTALUM, CHIP 47uF 10% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	Q4	8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-117-32 s TRANSISTOR 2SC4177 8-729-926-19 s TRANSISTOR 2SC4103-Q 8-729-118-58 s TRANSISTOR 2SK852-X4		
C36 C37 C38 C39 C40	1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V 1-164-363-11 s CERAMIC 560PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-164-677-11 s CERAMIC 0.033uF 10% 16V	Q11	8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177 8-729-117-32 s TRANSISTOR 2SC4177		
C41 C42 C43 C44 C45	1-135-215-21 s TANTALUM 6.8uF 20% 16V 1-135-215-21 s TANTALUM 6.8uF 20% 16V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-135-216-11 s TANTALUM 10uF 20% 10V 1-164-156-11 s CERAMIC 0.1uF 25V	R4	1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 1-216-801-11 s METAL 22 0.50% 1/16W 1-218-285-11 s METAL, CHIP 75 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W		
C46 C47 C48 C49 C50	1-164-156-11 s CERAMIC 0.1uF 25V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-135-216-11 s TANTALUM 10uF 20% 10V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-135-190-21 s TANTALUM 0.1uF 20% 20V	K7 R8 R9	1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-809-11 s METAL, CHIP 100 5% 1/16W 1-216-851-11 s METAL, CHIP 330K 5% 1/16W 1-216-832-11 s METAL, CHIP 8.2K 5% 1/16W 1-218-725-11 s METAL 24K 0.50% 1/16W		
C51 C52 C53 C54 C56	1-135-190-21 s TANTALUM 0.1uF 20% 20V 1-162-918-11 s CERAMIC, CHIP 18PF 5% 50V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V 1-162-957-11 s CERAMIC 220PF 5% 50V	R12 R13 R14	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-847-11 s METAL, CHIP 150K 5% 1/16W 1-218-344-11 s METAL 7.5K 0.50% 1/16W 1-218-695-11 s METAL 1.3K 0.50% 1/16W 1-218-289-11 s METAL 510 5% 1/16W		
C57	1-162-957-11 s CERAMIC 220PF 5% 50V	R16	1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W		

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(SG-194P BOARD)
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or Q'ty Part No. SP Description 1-216-841-11 s METAL, CHIP 47K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-842-11 s METAL, CHIP 56K 5% 1/16W 1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-218-714-11 s METAL 8.2K 0.50% 1/16W R18 R19 R20 R21 1-216-855-11 s METAL 680K 5% 1/16W 1-216-818-11 s METAL, CHIP 560 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-811-11 s METAL, CHIP 150 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R23 R24 R25 R26 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM 1-216-864-11 s METAL, CHIP 0-OHM 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM R29 R31 **R33** R34 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-831-11 s METAL, CHIP 6.8K 5% 1/16W R36 R37 R38 R39 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W R41 R42 **R44** 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W R49 R50 R51 R52 1-216-864-11 s METAL, CHIP 0-0HM 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM R54 **R55** R56 **R58** 1-218-740-11 s METAL 100K 0.50% 1/16W 1-218-883-11 s METAL, CHIP 33K 0.50% 1/16W 1-218-724-11 s METAL 22K 0.50% 1/16W 1-218-701-11 s METAL 2.4K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W R60 R61 R62 R63 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-218-668-11 s METAL, CHIP 100 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-218-668-11 s METAL, CHIP 100 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W R64 R65 R66 R67 R68 1-216-838-11 s METAL, CHIP 27K 5% 1/16W 1-216-804-11 s METAL 39 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-721-11 s METAL 16K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W R70 R71 R72 R73 1-218-732-11 s METAL 47K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W R75 R76 1-216-821-11 s METAL, CHIP 1K 5% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W 1-216-817-11 s METAL, CHIP 470 5% 1/16W R79 R80 R81

#### (SG-194P BOARD)

R83	1-218-716-11 s 1-218-727-11 s	METAL, CHIP 100K 5% 1/16W METAL 10K 0.50% 1/16W METAL 30K 0.50% 1/16W METAL 5.6K 0.50% 1/16W METAL 5.6K 0.50% 1/16W
R84 R85 R86 R87	1 210 002 11 0	METAL, CHIP 8.2K 5% 1/16W
R88 R89 R90 R91 R92	1-216-837-11 s 1-216-826-11 s 1-216-826-11 s	METAL, CHIP 2.2K 5% 1/16W METAL, CHIP 22K 5% 1/16W METAL, CHIP 2.7K 5% 1/16W METAL, CHIP 2.7K 5% 1/16W METAL, CHIP 4.7K 5% 1/16W
R93 R94 R95 R96 R97	1-216-826-11 s 1-216-819-11 s 1-216-821-11 s 1-216-825-11 s 1-216-809-11 s	METAL, CHIP 2.7K 5% 1/16W METAL, CHIP 680 5% 1/16W METAL, CHIP 1K 5% 1/16W METAL, CHIP 2.2K 5% 1/16W METAL, CHIP 100 5% 1/16W
RV1	1-238-090-11 s	RES, ADJ CERMET 10K

TG-102 BOARD (TG-102 BOARD)			
Ref. No.	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
lpc	A-8271-135-A o MOUNTED CIRCUIT BOARD, TG-102 (DXC-930/960MD/XC-009)	D1	8-719-820-05 s DIODE 1SS181
C1 C2 C3 C4 C5	A-8271-135-A o MOUNTED CIRCUIT BOARD, TG-102 (DXC-930/960MD/XC-009)  1-126-194-21 s ELECT 1.5uF 20% 50V 1-164-005-11 s CERAMIC, CHIP 0.47uF 25V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V	D2 D3 D4 D5 D6	8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181 8-719-820-05 s DIODE 1SS181 8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181
C6 C7 C8 C9	1-164-156-11 s CERAMIC 0.1uF 25V  1-164-156-11 s CERAMIC 0.1uF 25V  1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V  1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V  1-135-214-21 s TANTALUM, CHIP 20% 20V  1-164-156-11 s CERAMIC 0.1uF 25V  1-164-156-11 s CERAMIC 0.1uF 25V  1-126-199-11 s ELECT 6.8uF 20% 35V  1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V  1-164-156-11 s CERAMIC 0.1uF 25V  1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V  1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 6.3V	D7 D8 D9	8-719-820-05 s DIODE 1SS181 8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181
C9 C1 <b>0</b>	1-135-214-21 s TANTALUM 4.7uF 20% 20V 1-164-156-11 s CERAMIC 0.1uF 25V	IC1 IC2	8-752-327-48 s IC CXD1250N 8-752-351-03 s IC CXD1256AR
C11 C12 C13	1-164-156-11 s CERAMIC 0.1uF 25V 1-126-199-11 s ELECT 6.8uF 20% 35V	103 104 105	8-752-327-48 s IC CXD1250N 8-759-925-90 s IC SN74HC74NS 8-759-927-46 s IC SN74HC00NS
	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V	IC6 IC7 IC8	8-752-327-48 s IC CXD1250N 8-752-351-03 s IC CXD1256AR 8-759-036-25 s IC MC74AC04M
C17 C18 C19 C20 C21	1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-164-005-11 s CERAMIC, CHIP 0.47uF 25V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V	Q1 Q2 Q3 Q5 Q6	8-729-117-32 s TRANSISTOR 2SC4177 8-729-429-44 s TRANSISTOR XP1501 8-729-429-98 s TRANSISTOR XP1401 8-729-117-32 s TRANSISTOR 2SC4177 8-729-429-44 s TRANSISTOR XP1501
C22 C23 C24 C25 C26	1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V  1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-164-005-11 s CERAMIC, CHIP 0.47uF 25V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V  1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-214-21 s TANTALUM, CHIP 20% 20V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-126-199-11 s ELECT 6.8uF 20% 35V	07 08 09 010	8-729-429-98 s TRANSISTOR XP1401 8-729-429-98 s TRANSISTOR XP1401 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-429-44 s TRANSISTOR XP1501
C27 C28 C29 C30 C31	1-126-199-11 s ELECT 6.8uF 20% 35V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V	R1 R2 R3 R4	1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W
C32 C33 C34 C35 C36	1-126-199-11 s ELECT 6.8uF 20% 35V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V	R6 R7 R8 R9 R10	1-216-864-11 s METAL, CHIP 0-0HM 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
C37 C38 C39 C40 C41	1-162-964-11 s CERAMIC 0.001uF 10% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V 1-135-180-21 s TANTALUM, CHIP 3.3uF 20% 6.3V	R11 R12 R16 R17	1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-0HM 1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
C42 C43 C44 C45 C46	1-164-156-11 s CERAMIC 0.1uF 25V 1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-126-194-21 s ELECT 1.5uF 20% 50V 1-164-005-11 s CERAMIC, CHIP 0.47uF 25V	R19 R20 R21 R22	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W 1-216-813-11 s METAL, CHIP 220 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W
C47 C48 C49 C50 C51	1-126-194-21 s ELECT 1.5uF 20% 50V 1-162-919-11 s CERAMIC, CHIP 22PF 5% 50V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-135-214-21 s TANTALUM 4.7uF 20% 20V 1-164-156-11 s CERAMIC 0.1uF 25V	R24 R25 R26 R27	1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
C52 C53 C54	1-126-199-11 s ELECT 6.8uF 20% 35V 1-135-157-21 s TANTALUM, CHIP 10uF 10% 6.3V 1-164-156-11 s CERAMIC 0.1uF 25V	R29	1-216-813-11 s METAL, CHIP 220 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W
CN1 CN2 CN3	1-691-630-21 o CONNECTOR, FFC/FPC (ZIF) 20P 1-691-630-21 o CONNECTOR, FFC/FPC (ZIF) 20P 1-691-630-21 o CONNECTOR, FFC/FPC (ZIF) 20P	R31 R32	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-813-11 s METAL, CHIP 220 5% 1/16W

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Ref. No. or Q'ty	Part No. SP Description
R34 R35 R36 R37 R38	1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-813-11 s METAL, CHIP 220 5% 1/16W
R39 R40 R41 R42 R43	1-216-813-11 s METAL, CHIP 220 5% 1/16W 1-216-850-11 s METAL 270K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W
R44 R45 R46 R47	1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
RV1 RV2 RV3 RV4 RV5	1-238-092-11 s RES, ADJ CERMET 47K 1-238-091-11 s RES, ADJ CERMET 22K 1-238-092-11 s RES, ADJ CERMET 47K 1-238-091-11 s RES, ADJ CERMET 22K 1-238-091-11 s RES, ADJ CERMET 22K
RV6	1-238-092-11 s RES, ADJ CERMET 47K

### TG-102P BOARD

Ref. No. or Q'ty	Part No. SP	Description
1pc	A-8271-137-A o	MOUNTED CIRCUIT BOARD, TG-102P (DXC-930P,XC-009P)
C1 C2 C3 C4 C5	1-164-005-11 s 1-126-194-21 s 1-135-157-21 s	ELECT 1.5uF 20% 50V CERAMIC, CHIP 0.47uF 25V ELECT 1.5uF 20% 50V TANTALUM, CHIP 10uF 10% 6.3V CERAMIC 0.1uF 25V
C6 C7 C8 C9 C10	1-135-157-21 s	CERAMIC 0.1uF 25V TANTALUM, CHIP 10uF 10% 6.3V TANTALUM, CHIP 10uF 10% 6.3V TANTALUM 4.7uF 20% 20V CERAMIC 0.1uF 25V
C11 C12 C13 C14 C15	1-135-180-21 s 1-164-156-11 s	CERAMIC 0.1uF 25V ELECT 6.8uF 20% 35V TANTALUM, CHIP 3.3uF 20% 6.3V CERAMIC 0.1uF 25V TANTALUM, CHIP 10uF 10% 6.3V
C17 C18 C19 C20 C21	1-126-194-21 s 1-164-005-11 s 1-126-194-21 s	CERAMIC, CHIP 0.01uF 10% 25V ELECT 1.5uF 20% 50V CERAMIC, CHIP 0.47uF 25V ELECT 1.5uF 20% 50V CERAMIC, CHIP 22PF 5% 50V
C22 C23 C24 C25 C26	1-135-157-21 s 1-135-214-21 s 1-164-156-11 s	CERAMIC, CHIP 22PF 5% 50V TANTALUM, CHIP 10uF 10% 6.3V TANTALUM 4.7uF 20% 20V CERAMIC 0.1uF 25V CERAMIC 0.1uF 25V
C27 C28 C29 C30 C31	1-135-180-21 s 1-164-156-11 s 1-164-156-11 s	
C32 C33 C34 C35 C36	1-135-157-21 s 1-164-156-11 s 1-135-157-21 s	CERAMIC 0.1uF 25V TANTALUM, CHIP 10uF 10% 6.3V CERAMIC 0.1uF 25V TANTALUM, CHIP 10uF 10% 6.3V CERAMIC 0.1uF 25V
C37 C38 C39 C40 C41	1-135-157-21 s 1-164-156-11 s	CERAMIC 0.001uF 10% 50V CERAMIC, CHIP 22PF 5% 50V TANTALUM, CHIP 10uF 10% 6.3V CERAMIC 0.1uF 25V TANTALUM, CHIP 3.3uF 20% 6.3V
C42 C43 C44 C45 C46	1-162-970-11 s 1-162-919-11 s 1-126-194-21 s	CERAMIC 0.1uF 25V CERAMIC, CHIP 0.01uF 10% 25V CERAMIC, CHIP 22PF 5% 50V ELECT 1.5uF 20% 50V CERAMIC, CHIP 0.47uF 25V
C47 C48 C49 C50 C51	1-162-919-11 s 1-135-157-21 s 1-135-214-21 s	ELECT 1.5uF 20% 50V CERAMIC, CHIP 22PF 5% 50V TANTALUM, CHIP 10uF 10% 6.3V TANTALUM 4.7uF 20% 20V CERAMIC 0.1uF 25V
C52 C53 C54	1-135-157-21 s	ELECT 6.8uF 20% 35V TANTALUM, CHIP 10uF 10% 6.3V CERAMIC 0.1uF 25V
CN1 CN2 CN3	1-691-630-21 o	CONNECTOR, FFC/FPC (ZIF) 20P CONNECTOR, FFC/FPC (ZIF) 20P CONNECTOR, FFC/FPC (ZIF) 20P

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(TG-102P	BOARD)	(TG-102P	BOARD)
Ref. No. or Q'ty	Part No. SP Description	Ref. No. or Q'ty	Part No. SP Description
D1	8-719-820-05 s DIODE 1SS181	R34	1-216-857-11 s METAL, CHIP 1M 5% 1/16W
D2 D3 D4 D5 D6	8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181 8-719-820-05 s DIODE 1SS181 8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181		1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-813-11 s METAL, CHIP 220 5% 1/16W
D7 D8 D9	8-719-820-05 s DIODE 1SS181 8-719-800-76 s DIODE 1SS226 8-719-820-05 s DIODE 1SS181	R41 R42	1-216-813-11 s METAL, CHIP 220 5% 1/16W 1-216-850-11 s METAL 270K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W
IC1 IC2 IC3 IC4 IC5	8-752-327-48 s IC CXD1250N 8-752-351-03 s IC CXD1256AR 8-752-327-48 s IC CXD1250N 8-759-925-90 s IC SN74HC74NS 8-759-927-46 s IC SN74HC00NS	R46 R47	1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W
IC6 IC7 IC8	8-752-327-48 s IC CXD1250N 8-752-351-03 s IC CXD1256AR 8-759-036-25 s IC MC74AC04M	RV1 RV2 RV3 RV4 RV5	1-238-092-11 s RES, ADJ CERMET 47K 1-238-091-11 s RES, ADJ CERMET 22K 1-238-092-11 s RES, ADJ CERMET 47K 1-238-091-11 s RES, ADJ CERMET 22K 1-238-091-11 s RES, ADJ CERMET 22K
Q1 Q2 Q3 Q5 Q6	8-729-117-32 s TRANSISTOR 2SC4177 8-729-429-44 s TRANSISTOR XP1501 8-729-429-98 s TRANSISTOR XP1401 8-729-117-32 s TRANSISTOR 2SC4177 8-729-449-44 s TRANSISTOR XP1501		1-238-092-11 s RES, ADJ CERMET 47K
Q7 Q8 Q9 Q10 Q11	8-729-429-98 s TRANSISTOR XP1401 8-729-429-98 s TRANSISTOR XP1401 8-729-117-16 s TRANSISTOR 2SA1611-M6 8-729-117-32 s TRANSISTOR 2SC4177 8-729-429-44 s TRANSISTOR XP1501	FRAME Ref. No.	Nort We GD Decoulation
R1 R2	1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL CHIP 10K 5% 1/16W		Part No. SP Description -547-463-11 o FILTER UNIT, OPTICAL
R1 R2 R3 R4 R5	1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W	CN1F(to MB	3-380 board) -949-642-11 o HARNESS (ZOOM) 1-565-122-11 o HOUSING, 3P 1-565-164-21 o CONTACT, FEMALE AWG26-28
R7 R8 R9 R10	1-216-864-11 s METAL, CHIP 0-OHM 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-857-11 s METAL, CHIP 1M 5% 1/16W 1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W	CN12F(to M	B-380 board) -949-643-11 o HARNESS (IRIS) 1-565-123-11 o HOUSING, 4P 1-565-164-21 o CONTACT, FEMALE AWG26-28
R11 R12	1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W		-562-222-21 s CONNECTOR, 6P FEMALE "LENS"
R15 R17 R18	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-864-11 s METAL, CHIP 0-OHM 1-216-850-11 s METAL 270K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W		-691-629-11 s CONNECTOR, 20P MALE "CCU" (DXC-930/930P/960MD)
R19 R20	1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-843-11 s METAL, CHIP 68K 5% 1/16W	CN4 1	-562-381-00 s CONNECTOR, 12P MALE "DC IN/VBS" (XC-009/009P)
R21 R22 R23	1-216-813-11 s METAL, CHIP 220 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W	CN5 1-	-580-090-11 s CONNECTOR, D-SUB 9P "RGB/SYNC"
R24	1-216-857-11 s METAL, CHIP 1M 5% 1/16W	CN6 1-	-562-381-00 s CONNECTOR, 12P MALE "DC IN/REMOTE (DXC-930/930 P/960MD)
R26 R27	1-216-835-11 s METAL, CHIP 15K 5% 1/16W 1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-837-11 s METAL, CHIP 22K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W		-563-929-11 s CONNECTOR, 4P FEMALE "CONTROL" (XC-0 09/009P)
R29	1-216-813-11 s METAL, CHIP 220 5% 1/16W		-580-724-21 s CONNECTOR, BNC "GENLOCK"
R31 R32	1-216-833-11 s METAL, CHIP 10K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-845-11 s METAL, CHIP 100K 5% 1/16W 1-216-813-11 s METAL, CHIP 220 5% 1/16W	CN8 1-	-580-724-21 s CONNECTOR, BNC "VIDEO OUT"

# SECTION E CHANGED PARTS

CN-579 BOARD (For D)	C-930/930P/9	60MD)
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OLD)	C22	NOT IN USE.	
112)	C22		TANTALUM, CHIP 10uF 10% 20V
OLD)	R37	1-218-298-11 s	METAL, CHIP 2.2K 1% 1/16W
207)	R37	1-218-271-11 s	METAL 2K 0.50% 1/16W
OLD)	R38	1-216-864-11 s	METAL, CHIP O-OHM
207)	R38	1-218-286-11 s	METAL, CHIP 91 0.50% 1/16W

NOTE: The numbers identified by making with ) are matching with each serial numbers.

### CN-580 BOARD(For XC-009/009P)

OLD)	R31	1-216-864-11 s	METAL, CHIP 0-OHM
207	R31	1-218-286-11 s	METAL, CHIP 91 0.50% 1/16W
OLD)	R32	1-218-298-11 s	METAL, CHIP 2.2K 1% 1/16W
207)	R32	1-218-271-11 s	METAL 2K 0.50% 1/16W

OLD) C6: 203) C6: OLD) C6: 203) C6: OLD) C6- 203) C6-	2 1-135-210-11 s 3 NOT IN USE. 3 1-135-210-11 s 4 NOT IN USE.	TANTALUM 4.7uF 20% 10V TANTALUM 4.7uF 20% 10V CERAMIC, CHIP 6PF 50V
OLD) R9:	4 8-729-427-83 s 9 1-216-827-11 s 9 1-216-823-11 s 17 1-216-807-11 s	METAL, CHIP 1.5K 5% 1/16W METAL, CHIP 68 5% 1/16W
OLD) R14 202) R14 OLD) R14 203) R14 OLD) R15 203) R15	42 1-216-864-11 s 46 1-216-827-11 s 46 1-216-825-11 s 56 NOT IN USE.	METAL, CHIP 82 5% 1/16W METAL, CHIP 0-OHM METAL, CHIP 3.3K 5% 1/16W METAL, CHIP 2.2K 5% 1/16W METAL, CHIP 10K 5% 1/16W
OLD) R15 203 R15 OLD) R15 203 R15 204 R15 203 R15 203 R15	57 1-216-827-11 s 58 NOT IN USE. 58 1-218-740-11 s 58 1-218-739-11 s 59 NOT IN USE.	METAL, CHIP 3.3K 5% 1/16W METAL, CHIP 100K 0.50% 1/16W METAL, CHIP 91K 0.50% 1/16W METAL 2.2K 0.50% 1/16W

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MB-380 BOARD
                                                                                                                     (PR-158 BOARD)
                                                                                                                                             1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-830-11 s METAL, CHIP 5.6K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
                         1-690-670-11 s CABLE, FLAT (1.0MM)
1-690-670-12 s CABLE, FLAT (1.0MM)
1-690-670-11 s CABLE, FLAT (1.0MM)
1-690-670-12 s CABLE, FLAT (1.0MM)
1-412-026-11 s INDUCTOR CHIP 1uH
                                                                                                                               R172
R172
R173
R173
OLD)
203)
                                                                                                                    OLD)
203)
OLD)
                                                                                            15P
           CN10
OLD)
 203)
            CN11
                                                                                                                     203
OLD
                                                                                                                                R173
203)
                         DELETED.
                                                                                                                                             1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W 1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
                                                                                                                    OLD)
                                                                                                                    203)
OLD)
                                                                                                                                R177
R180
OLD)
112)
                         NOT IN USE.
1-412-535-41 s INDUCTOR 68UH
                                                                                                                    204
                                                                                                                                R180
                                                                                                                                             NOT IN USE.
1-218-252-11 s METAL, CHIP 2.26K 0.5% 1/10W
                                                                                                                    OLD)
                                                                                                                                R196
                                                                                                                     203)
                                                                                                                                R196
                                                                                                                                             1-218-271-11 s METAL 2K 0.50% 1/16W
1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W
1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
1-216-824-11 s METAL, CHIP 1.8K 5% 1/16W
1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
                                                                                                                    OLD)
                                                                                                                                R197
                                                                                                                                R197
R199
                                                                                                                    203
                                                                                                                    OLD)
203)
OLD)
PR-158 BOARD
                                                                                                                               R199
R212
                         1-162-908-11 s CERAMIC 3PF 0.25PF 50V

1-162-910-11 s CERAMIC 5PF 0.25PF 50V

1-162-908-11 s CERAMIC 3PF 0.25PF 50V

1-162-910-11 s CERAMIC 5PF 0.25PF 50V

1-102-074-00 s CERAMIC 0.001uF 10% 50V

1-162-964-11 s CERAMIC CHIP 0.001uF 10% 50V
                                                                                                                     203)
 112)
                                                                                                                                             1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W 1-216-821-11 s METAL, CHIP 1K 5% 1/16W NOT IN USE.
1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W NOT IN USE.
           C50
C50
OLD)
                                                                                                                    OLD)
                                                                                                                                R244
                                                                                                                    203)
OLD
203)
OLD
                                                                                                                                R244
R282
R282
R283
112)
OLD)
203)
OLD)
                         NOT IN USE.
                                                                                                                    203)
                                                                                                                                R283
                                                                                                                                             1-216-821-11 s METAL, CHIP 1K 5% 1/16W
                         NOT IN USE.

1-162-927-11 S CERAMIC, CHIP 100PF 5% 50V

8-729-117-32 S TRANSISTOR 2SC4177

8-729-427-83 S TRANSISTOR XP6501

8-729-117-16 S TRANSISTOR 2SA1611-M6

8-729-427-83 S TRANSISTOR XP6501
 203)
            C128
                                                                                                                                             NOT IN USE.
1-216-821-11 s METAL, CHIP 1K 5% 1/16W
NOT IN USE.
1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W
NOT IN USE.
            056
056
OLD)
                                                                                                                    OLD)
                                                                                                                                R284
 203)
                                                                                                                    203
                                                                                                                                R284
                                                                                                                                R285
R285
R286
OLD
            064
064
                                                                                                                    OLD
                                                                                                                    203
OLD
                         NOT IN USE.
8-729-117-32 s TRANSISTOR 2SC4177
NOT IN USE.
8-729-117-32 s TRANSISTOR 2SC4177
NOT IN USE.
                                                                                                                                             1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W
OLD)
                                                                                                                    203)
                                                                                                                                R286
203
OLD
                                                                                                                    OLD)
                                                                                                                                             1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W NOT IN USE.
            089
090
090
 203)
                                                                                                                    203
                                                                                                                                R287
                                                                                                                    OLD'
                                                                                                                                R288
OLD)
                                                                                                                                            1-216-822-11 s METAL, CHIP 1.2K 5% 1/16W
NOT IN USE.
1-216-823-11 s METAL, CHIP 1.5K 5% 1/16W
                         8-729-117-32 s TRANSISTOR 2SC4177
                                                                                                                    203
                                                                                                                                R288
                                                                                                                                R289
R289
                                                                                                                    OLD
                         NOT IN USE.

1-218-700-11 s METAL 2.2K 0.50% 1/16W

1-216-835-11 s METAL, CHIP 15K 5% 1/16W

1-218-253-11 s METAL, CHIP 2.32K 0.5% 1/10W

1-218-716-11 s METAL 10K 0.50% 1/16W

1-218-255-11 s METAL, CHIP 2.67K 0.5% 1/10W
OLD)
203)
OLD)
            R136
                                                                                                                    OLD)
                                                                                                                                R290
            R137
                                                                                                                                             1-216-829-11 s METAL, CHIP 4.7K 5% 1/16W NOT IN USE.
203
            R137
                                                                                                                    203)
                                                                                                                                R290
            R138
                                                                                                                    OLD)
                                                                                                                                R291
                                                                                                                                             1-216-826-11 s METAL, CHIP 2.7K 5% 1/16W NOT IN USE.
            R138
                                                                                                                    203
                                                                                                                                R291
                                                                                                                    203
                                                                                                                                R292
                         1-218-716-11 s METAL 10K 0.50% 1/16W 1-218-700-11 s METAL 2.2K 0.50% 1/16W 1-218-697-11 s METAL 1.6K 0.50% 1/16W
OLD'
            R139
                                                                                                                    203)
                                                                                                                                R292
                                                                                                                                             1-216-827-11 s METAL, CHIP 3.3K 5% 1/16W
203)
OLD)
            R139
R143
R143
                                                                                                                    OLD)
                                                                                                                                R293
                                                                                                                                             NOT IN USE.
                                                                                                                                             1-249-441-11 s CARBON, 100K 5% 1/4W
1-216-845-11 s METAL, CHIP 100K 5% 1/16W
203)
                                                                                                                    203
                                                                                                                                R293
            R145
OLD
                         1-218-272-11 s METAL 5.1K 0.50% 1/16W
                                                                                                                    207
                                                                                                                                R293
            R145
                         DELETED.
                                                                                                                    OLD)
                                                                                                                                R294
                                                                                                                                             NOT IN USE.
                                                                                                                    207)
                                                                                                                                             1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W
                                                                                                                                R294
OLD)
            R146
                         1-218-706-11 s METAL 3.9K 0.50% 1/16W
                                                                                                                               R295
203
           R146
R147
                         DELETED.
                                                                                                                    OLD)
                                                                                                                               R295
                                                                                                                                             1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W NOT IN USE.
OLD)
                         1-218-704-11 s METAL 3.3K 0.50% 1/16W
                                                                                                                    207)
            R147
203
                         DELETED.
                                                                                                                    OLD)
                                                                                                                                R296
OLD'
            R148
                         1-218-706-11 s METAL 3.9K 0.50% 1/16W
                                                                                                                                R296
                                                                                                                                             1-216-828-11 s METAL, CHIP 3.9K 5% 1/16W
            R148
                         DELETED.
                                                                                                                    OLD)
                                                                                                                               R300
                                                                                                                                            1-216-063-00 s METAL, CHIP 3.9K 5% 1/10W NOT IN USE.
NOT IN USE.
                                                                                                                   204)
207)
                                                                                                                               R300
R300
            R149
R149
OLD)
                         1-218-707-11 s METAL 4.3K 0.50% 1/16W
203)
OLD)
                         DELETED.
                        1-218-706-11 s METAL 3.9K 0.50% 1/16W DELETED.
            R150
                                                                                                                   OLD)
                                                                                                                               R301
                                                                                                                                             1-216-063-00 s METAL, CHIP 3.9K 5% 1/10W
203)
            R150
                                                                                                                    204)
                                                                                                                               R301
                                                                                                                                             NOT IN USE.
OLD)
                         NOT IN USE
                                                                                                                               R301
                         1-218-256-11 s METAL, CHIP 3.32K 0.5% 1/10W
```

)

203)

R301

R302

R302 R302

NOT IN USE.

1-216-063-00 s METAL, CHIP 3.9K 5% 1/10W

OLD)

204) 207)

## SG-194/194PBOARD

OLD)	C55 C55	1-162-923-11 s CERAMIC, CHIP 47PF 5% 50V DELETED.
OLD (	C66 C66	1-162-806-11 s CERAMIC 0.1uF 10% 50V DELETED.
OLD) 203 OLD) 203) OLD) 202)	C67 C67	NOT IN USE. 1-164-156-11 s CERAMIC 0.1uF 25V
OLD) 112)	R63 R63	1-216-834-11 s METAL, CHIP 12K 5% 1/16W 1-218-716-11 s METAL 10K 0.50% 1/16W

### SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

- A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments
- A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
- 3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

